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# OVERHEAD COSTS

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BY

SIR HENRY BUNBURY, K.C.B.

COMPTROLLER AND ACCOUNTANT-GENERAL OF THE POST OFFICE



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## PREFACE

THE purpose of this little book is to assist those who are interested in the economics of industry and trade under modern conditions, whether as students or as men of business.

One of the most difficult, as it is one of the most important, problems for the industrial or commercial executive is to adapt his practice to the new conditions which scientific and technical progress are constantly creating. We do our thinking with a stock-in-trade of ideas and principles based on past experience—absolutely sound, no doubt, so long as the conditions in which they were evolved, and which they were made to fit, remain. But the last few years have seen a greater and more rapid advance in scientific and technical achievement than has ever before been known. Do the old ideas and principles still hold under these new conditions? These are questions which it seems very necessary to answer; and to answer them involves the re-analysis of industry and commerce as it is to-day and as it is going to be to-morrow.

In that analysis we find that overhead cost has emerged as a factor of new and, in many cases, preponderating significance. It has to be regarded not as a fact but as a force: a thing which determines industrial and commercial policy, and even the political action of governments. The "flow of resources into various productive uses" of which economists speak presents a misleading picture, at any rate on a short-range view. What we see, rather, is banked-up productive capacity seeking productive employment. The paths which it must follow in its search are determined by cost of

production ; and cost of production under these conditions is a very elusive thing.

Here accountancy must help ; and anyone who observes the lines on which cost accountancy has been thinking, and developing its practice, in the last few years, will perceive that it is awaking to the need. This broadening of the outlook of accountancy is indeed significant. On the financial side value, and on the cost side overhead, are coming to be recognized as factors to which the accountant must direct his special attention if he is to render the service expected of him.

One corollary is that the study of "economics" must take a definite place in the training of the professional accountant. Here, again, progress may be observed. The professional organizations are becoming alive to the need. But there is still a problem : What sort of training ? What sort of economics ? So wide has the subject become in its scope and ramifications, that a specialized point of view seems essential if the futility of a mere superficial acquaintance with textbooks in elementary economics is to be avoided. I venture to think that it would be wise to concentrate the study of this subject on what Sir William Ashley has called "Business Economics," as distinct from Political Economy, and on the economic approach and attitude to the problems with which the accountant will be confronted in his professional practice. What he needs is not a body of possibly undigested knowledge, but a tool with which to work.

The relation, here indicated, between accountancy and economics, has received earlier, and more, attention in the United States than in this country. Hence (since this little book lays no claim to originality) I have to acknowledge, with pleasure, a special indebtedness to

Professor Maurice Clark, of Columbia University, whose *Economics of Overhead Cost* has won for itself a distinguished place in the constructive literature of business economics.

My object has been to suggest the lines of approach in the study of a force which is clearly exercising a dominating influence in the structure, policies, and performance of modern industry. For those who wish to pursue that study, much valuable material, not otherwise available, will be found in the work of the Balfour Committee on Trade and Industry, published under the title of *Further Factors in Industrial and Commercial Efficiency* (1928).

Most of what follows was written before the present acute depression in world industry set in ; the conditions now prevailing seem to me to set in an even clearer light the predominating significance of overhead cost in the working of the industrial system, and, consequently, its importance as an angle of observation.

H. N. B.

LONDON.  
*September, 1931.*



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# OVERHEAD COSTS

## CHAPTER I

### INTRODUCTORY

OVERHEAD cost is one of the dominating factors of modern industry. It is a subject to which economic science, though it has been slow to realize its significance, or even its existence, has in recent years devoted increasing attention. It is, moreover, a common ground on which the economist, the accountant, and the industrial "engineer" (to use a convenient American term) meet. "Overhead" is the expression in terms of money of productive capacity. The effort of productive capacity to find employment in actual production is one of the strongest forces operating in industry—a force whose activity was never more conspicuous than it is in the conditions of world industry at the present time.

Economics was for a long time curiously indifferent to overhead cost as a specific economic factor, just as accountancy, when it concerned itself with costs, as distinct from profit and loss or solvency and insolvency, at all, was apt to regard overheads not as a subject on which accounts could throw valuable light, but as a troublesome complication which could not be ignored, but which had better be disposed of as easily and painlessly as possible. It is an interesting coincidence that the railways, which, by providing transportation to distant markets first made large-scale production

possible, were also the cause of attention being directed to the economic force which overhead costs exert. For it was the efforts of the railways to find more traffic for their unused traffic capacity by reduced and special rates of one kind and another, and the violent public controversies which those rating anomalies created, which led economists to see that in unused productive capacity—in “idle overhead”—there was an economic force at work which deserved a good deal more study than it had as yet received. In recent years, however, the science of economics has developed a new viewpoint—that of business economics as distinguished from political economy. With it has come an increasing attention to our subject by economists.

To the older economists production was typified by agriculture and mining, or by home or factory production in which labour and materials were the main elements of cost and fixed capital was a relatively small and controllable factor. Supply was accordingly conceived as something which could readily be adjusted to demand without material variation of cost, and cost of production was thought of as something which varied only with natural advantages and with efficiency of management and labour; subject to this, it was regarded as something constant and tending always to uniformity.

But the age in which we live is dominated by the machine. The machine is the master of our business policy. Work must be found for it. It cannot be paid off when orders are few, nor can it, except within comparatively narrow limits, be switched over from one class of production to another. When it is idle, it represents so much invested capital, subject very often to fixed interest charges earning no return, so much

depreciation and obsolescence, so much upkeep, and so much accommodation, running on without producing the means to pay for them. Nor is the problem merely one of obtaining work. It is equally a problem of factory organization. For, wherever there is a productive unit which is not at work for the largest attainable proportion of the time, there is idle capacity and economic waste. The absorption of unused capacity, whether by use or elimination, is one of the main objectives to which the modern movement known compendiously as rationalization directs itself.

And behind the machine lies the organization—equally specialized, a little easier to get rid of when work is slack (for men can be discharged though machines cannot), but still in the main a standing charge or overhead, for the reason that the building up and training of an efficient designing, controlling and selling organization is the work of years, and no far-seeing management will get rid of its pivotal men so long as there is any prospect of using them.

So we find that in the course of two or three generations the economic conditions of industry have altered in a rather fundamental way. We can no longer regard supply as something which will adjust itself with relatively little economic discomfort to the fluctuations of demand. Nor can we regard cost of production as something which is approximately uniform as between one producer and another, or as between one time and another. On the contrary, supply is in the hands of great aggregations of capital possessing enormous productive capacity and straining every nerve to find their markets. They must create the demand which will keep the wheels turning, and earn revenue for the investment which they represent, even if only to meet the fixed interest charges. Cost of

production often depends more upon the percentage of its capacity at which a particular undertaking is working than upon the skill of its management, the efficiency of its equipment, or the efforts of its labour. Overhead costs, or fixed productive capacity, lie very near to the heart of most of the economic problems which to-day vex the souls of statesmen—protection in the home market, dumping, hostile tariffs, the development of new markets, unemployment, and the rationalization of industry.

It would be wrong, however, to assume that the problems of overhead cost are either created or solved by increasing the *scale* of production. The typical economies of large-scale production have very little to do with the utilization of unused capacity. The progressive and large reductions in production cost which Henry Ford achieved year by year as his methods were developed and his plant enlarged were due mainly to improvements in productive processes, not to the fact that he was able to carry a larger output with a less than proportionate increase in overhead cost. On the contrary, the larger the scale of production the higher the proportion of overhead cost to direct cost tends to be. It is the variable costs, rather than the fixed costs, that are reduced by modern large-scale methods. The reason is simple. More and more is done by machine, less and less by human effort.

Indeed, it may happen that the large undertaking, by aiming at being self-sufficient, may sometimes have partially idle plant for processes which the smaller undertaking, in order to avoid the waste of idle equipment, turns over to other firms which specialize in that particular process and which are in a better position to secure an even load of work. This, for instance, is characteristic of the Lancashire cotton industry. The

problem, therefore, of reducing the wastes of idle overhead is not the same as that of increasing the *scale* of production. To use an analogy from the electrical supply industry, it is a problem not of the volume of output, but of the load factor—that is, of the relation of the actual output to the maximum potential output of the existing plant.

There are, in fact, in any progressive industry two tendencies simultaneously at work which produce opposite effects on the overhead costs of the industry. On the one hand, there is the substitution of machine operation for labour, the effect of which is to increase the fixed capital employed per unit of product, and to increase still more the overhead cost expressed as a percentage of "direct" cost. On the other hand, there are the greater productive efficiency of the larger machine over the smaller, and, in general, the fact that the capacity of plant is apt to increase more rapidly than its size. Accompanying these there are the improvements in organization, in technical skill, in the methods of management and direction, and the greater flexibility which are more readily available to the large-scale producer, and these tend to a reduction of total cost per unit, and to keep that part of the cost which is "overhead" lower than it would be if they were absent. If confirmation of these arguments be needed, the conclusions of a well-informed investigator into the Yorkshire worsted industry may be quoted. "Even in the present depression," he writes, "it has often been the comparatively small unit that has been the most successful. From the technical point of view, it may be that the economies to be introduced by a mere increase in size become negligible after a comparatively moderate growth has been attained. But the case for the larger unit does not in the last resort rest upon

merely technical grounds. Even if the small unit were always economically as efficient as the large—which is by no means the case—the existence of a vast number of producers with conflicting interests, each trying to cut the other's throat, renders impossible the co-ordinated and concerted action of the industry as a whole, which is vitally necessary if the problem of surplus capacity and diminishing markets is to be dealt with efficiently.”<sup>1</sup>

“Overhead” is a term of accountancy, and since the accountant has a longer and closer acquaintance with it than anyone else, let us first see in a general way what he has to say about it.

Accountancy began as a record of money transactions, and at an early stage developed the technique of recording the creation of debts and their discharge. Its origin is to be found not in industry, but in trade. So far, the accounts dealt purely with definite and readily ascertainable facts, of which they were the record. But, as they came to be applied to manufacturing undertakings, it was gradually seen that in addition to providing a check on the firm's money, to showing the profit or loss on operation for any chosen period, and to recording the position of the firm in relation to each of its debtors and creditors, and its financial solvency or insolvency at any chosen date, they could be made to serve another purpose. By classifying expenses under suitably arranged heads, it became possible to observe in a systematic way the various *kinds* of expense which were incurred in order to conduct the firm's business. This process of classification or analysis enabled each component in the total of expenses of production to be watched and studied separately, while at the same time there was the

<sup>1</sup> *Times*, 12th Dec., 1927.

assurance that all the expenses would be included and nothing would be either understated or overstated, for otherwise the books would not balance.

So far, we are still in the region of readily ascertainable fact. It was, however, but a short step from this point when attempts were made to subdivide expenditure still further, and to bring out or earmark against each unit of production (whatever might be chosen as the unit) those expenses which were incurred in the production of that unit. Thus cost accounting began. And here we leave the region of readily ascertainable fact, and find ourselves confronted with the problem of the allocation of overhead costs.

Overhead, from the accounting point of view, means those expenses of production which cannot readily be allocated directly to particular units of production or particular productive processes. Take, for example, a printing works, and let us look at job No. 123, a leaflet, to be set up by hand composition. The wage expense is simple enough. You take the compositors' and printers' wages for the time they spent on the job. Paper you can deal with in the same way—the cost of the paper actually used on the job. But the cost to the printer of job No. 123 is much more than the wages and the materials used. There is the use of the printing machine, the power that drives it, the building in which the compositor works and in which the machine is installed, the lighting, heating, and cleaning of the building, the cost of the type used, the remuneration of the foreman and works manager, the office staff who dealt with the order and will render and collect the account for it, the store and the storekeeper who keeps the stock from which the paper is drawn, and so on.

All these things involve expense which in some way or other the business must recover from its customers

in the price of its products. They constitute the productive capacity of the undertaking. But if we set out to allocate them directly to the various jobs, we should find ourselves in hopeless difficulties. Some of them could, no doubt, be so allocated—at a price—the wages of the foreman and of some of the office staff, for instance. But it would be a costly and troublesome business, for it rarely happens that the time of employees of this class can be divided up exactly and neatly into sections corresponding with the various units of production in the works themselves. And when we come to the expenses of providing machinery, buildings, storekeeping, general supervision, etc., we find that their connection with particular jobs is far too remote to enable them to be charged direct to any particular job or set of jobs. Some of these “overheads” represent the investment of capital which is gradually being used up in production, but there is no means by which that using-up can be measured as each productive job is performed, and accordingly it is charged up to jobs in the form of depreciation by means of some method of proportionate allocation. Others of them represent current monetary outlay, but of so general a character that particular items cannot readily be brought up against particular items of production, e.g. the salaries of the management, and the cost of lighting and heating, and storekeeping. They are all treated as “overhead,” therefore, and distributed as an addition to the “direct” or “prime” costs of production by some system of proportionate allocation, ranging from the very simple and crude to the highly discriminative and complex.

## CHAPTER II

### OVERHEAD COSTS IN ACCOUNTING PRACTICE

LET us consider some of the methods of allocation of overheads. We will take the simpler types which are in common use, premising, by way of warning, that they represent the types which the student will find in ordinary commercial practice rather than the highest achievements of modern cost accountancy. In order to make the examples as illuminating as possible, let us assume certain common data as follows—

	£
Expenditure on direct labour in period	120,000
"      materials "	120,000
Overhead costs of undertaking in period—	£
Shop overheads . . . . .	60,000
Selling and general over- heads . . . . .	30,000
	<hr/> 90,000
	= { 37½% on labour and materials 75% on labour

Total productive man-hours in period, 1,800,000.

Overhead costs per man-hour, 12d.

Now for the examples. We will take in each case two typical units of production, in one of which the labour cost directly chargeable to the job is 12s. and the material 8s., while in the other the labour cost is 8s. and the material 12s. The former job is one in which a good deal of relatively cheap labour is used while the use of expensive machine processes is relatively small. The latter is one in which expensive machinery is largely used with high-grade labour, but much less of it. The jobs are done in different shops.

By Method I, the prime costs (labour and materials) being the same in each case, the total cost of the

product comes out the same. Or, in other words, each of the products is made to bear the same amount of the overheads. Analysis may show, however (and in most cases does), that the amount of overhead cost incurred, or capacity used, is far more closely connected

#### METHOD I

##### OVERHEADS DISTRIBUTED *Pro Rata* TO LABOUR AND MATERIALS

		Product A Cost	Product B Cost
Labour . . . . .		12s.	8s.
Materials . . . . .		8s.	12s.
Total prime costs . . . . .		20s.	20s.
Overheads— 37½ per cent on labour and materials		7·5s.	7·5s.
Total cost . . . . .		27·5s.	27·5s.

with the amount of labour employed than it is with the value of materials consumed. For that reason, where materials enter largely into the cost of production, and where the proportion of material cost in the cost of the product is liable to vary considerably as between one product and another, it is found to be dangerous to allow material cost to influence the allocation of overheads. It may lead to one article being priced too low, and another being priced too high. The consequence of this in a competitive market would be serious.

The next step, then, is to eliminate the influence of materials on the allocation of overheads, and so we come to Method II (see page 11).

By this very usual method we are assuming that overhead costs vary in direct proportion to the amount expended on labour for any product, irrespective of the other conditions of production. Now this, as we shall

see later, is a very large assumption. In fact, there are important overhead costs which vary not in proportion to labour, but in inverse proportion to labour, as we shall see when we come to Method IV. But in the

**METHOD II**  
**OVERHEADS DISTRIBUTED *Pro Rata* TO LABOUR**

	Product A Cost	Product B Cost
Labour . . . . .	12s.	8s.
Materials . . . . .	8s.	12s.
Total prime costs . . . . .	20s.	20s.
Overheads: 75 per cent on labour . . . . .	9s.	6s.
Total cost . . . . .	29s.	26s.

first instance there is the problem created by differences in the *rates* of wages paid. In our data we assumed a relatively cheaper grade of labour on product A than on product B, and our next method, which is merely a variant of Method II, allows for this.

**METHOD III**  
**OVERHEADS DISTRIBUTED *Pro Rata* TO MAN-HOURS**

	Product A Cost	Product B Cost
Labour . . . . .	12s. (10½ man-hours)	8s. (4½ man-hours)
Materials . . . . .	8s.	12s.
Total prime costs . . . . .	20s.	20s.
Overheads: 12d. per man-hour . . . . .	10·67s.	4·33s.
Total cost . . . . .	30·67s.	24·33s.

Here the product which employs the cheaper labour gains no advantage from that fact, and is assessed strictly on the *quantity* of labour employed, while the product which employs the dearer labour gains correspondingly. This is often closer to the facts.

So far, although the bases on which the overheads are allocated have differed, we have made no distinction between product A and product B. We have, in fact, conceived that what was sauce for the goose A would be sauce for the gander B. But it will be remembered that these products are made in different shops, by different methods, and by different grades of labour. The cost accountant will accordingly point out to us that any proportionate allocation which does not take these differences fully into account is likely to give misleading results. Goose and gander have different habits and require different sauces. And so we get the development of a separate ascertainment or analysis of overhead for each shop or other productive unit before distribution begins. This is illustrated by Method IV, in which we assume that, by analysis, out of the total overheads of £90,000 the proportion attributable to the one shop represents 50 per cent on the labour employed in that shop, and the proportion attributable to the other  $112\frac{1}{2}$  per cent on its labour. We then get the result shown on page 13.

Compare these figures with those given by Method II. One example will suffice, and we need not trouble to illustrate the combination of this development with the labour plus material basis or the man-hour basis. We will, however, illustrate one further development. Hitherto factory overheads and selling and general overheads have been treated as a single distributable whole, but our ingenious cost accountant, in his incessant effort to get closer to the facts, will point out, with

great force, that selling and general overheads, whatever they are governed by, are at any rate not governed by labour alone. They are, let us say, more closely related to the value of the products handled for the reason that

#### METHOD IV

OVERHEADS DISTRIBUTED *Pro Rata* TO LABOUR,  
BUT SEPARATE AMOUNTS ASCERTAINED FOR EACH  
SHOP OR PRODUCTIVE UNIT

	Product A Cost	Product B Cost
Labour . . . .	12s.	8s.
Materials . . . .	8s.	12s.
Total prime costs . . .	20s.	20s.
Overheads . . . .	50% on labour 6s.	112½% on labour 9s.
Total cost . . . .	26s.	29s.

the more the product will fetch the more it pays to spend on selling it, and on general management. He, therefore, makes a further division of his overheads into the two categories mentioned, and treats them differently. We will illustrate one way of doing this, in combination with Method IV, as shown on page 14.

The foregoing examples will suffice to illustrate the way in which accountancy treats the subject of overhead costs. They are by no means exhaustive. We may mention, for instance, the machine-hour method, by which some or all of the factory overheads are allocated to products on the basis of machine hours. For each machine, or group of machines, the costs attributable to its operation are ascertained and expressed as a rate per hour of working for that machine. This method is important and valuable as an attempt

to get down even more closely to the factors which control overhead expenditure, and is appropriate where machine processes play a large part in the costs of

#### METHOD V

**FACTORY OVERHEADS DISTRIBUTED *Pro Rata* TO LABOUR  
WITH SEPARATE OVERHEADS FOR EACH SHOP.**

**SELLING AND GENERAL OVERHEADS DISTRIBUTED *Pro Rata*  
TO FACTORY COST OF PRODUCT**

	Product A Cost	Product B Cost
Labour . . . .	12s.	8s.
Materials . . . .	8s.	12s.
Total prime cost . . . .	20s.	20s.
Factory overheads . . .	33½% on labour 4s.	75% on labour 6s.
Total factory cost . . . .	24s.	26s.
Selling and general over- heads—		
10% on factory cost . . .	2·4s.	2·6s.
Total cost . . . .	26·4s.	28·6s.

production. The very important "standard burden" method introduces an altogether different principle, and will be referred to in more detail later (Chapter IV, page 51).

## CHAPTER III

### WHAT THE ACCOUNTANCY RESULTS MEAN

If now we look at the figures which are represented to be the cost of our pair of products, we observe that they differ materially according to the method adopted for dealing with overheads. The cost of product A is given as 26s., 26s. 5d., 27s. 6d., 29s., and 30s. 8d., and that of product B as 24s. 4d., 26s., 27s. 6d., 28s. 7d., and 29s. Moreover, while some methods report A to be more costly than B, others report the reverse. And it will be noted that the differences are due solely to the overhead element in the total cost. Clearly, therefore, our next step must be to inquire what it is that accountancy is trying to do, and why it is that what purports to be a statement of fact—the cost of producing a thing—can masquerade under so many different and inconsistent disguises? Moreover, the examples which we have given are by no means extreme. On the contrary, the differences in result, according to the method adopted, would be much greater where costs classified as overhead form a much larger part of the total cost of production—e.g. where mass production methods are used and the costs of machinery and machine tools bulk very large, or, again, in a case where a large part of the cost of production consists in the preparatory and testing and supervising work of a highly skilled technical and scientific staff, as in some classes of electrical products. Overhead percentages of as much as 250 per cent on labour are nowadays by no means unusual in some industries. Similarly, where there are several departments of the business performing different

processes which employ labour, materials, plant, etc., in quite different proportions, it will make a lot of difference which basis is adopted for the allocation of the overheads, and a basis which is reasonably close to the facts in one department may be wildly out in another.

Let it be said at once that for these reasons the best cost accounting practice lays stress on two points: (1) The treatment of each productive department or shop as a separate unit. It must be studied by itself. Its overheads must be separately taken out as far as practicable, and the basis of allocating those overheads to units of production must be chosen in the light of the actual circumstances and conditions which govern production in that particular department or shop. This is the principle of departmentalization. In what is known as "multiple costing" it is fundamental. (2) In choosing the method for distributing or allocating the overhead, the object must be to find that factor which most closely regulates each item of overhead cost. In one case it may be labour, expressed either in terms of wages (when wages are fairly uniform) or in terms of man-hours (where they are not). This would be the case, for instance, with accommodation costs where comparatively little machinery is employed, with the costs of many of the less expensive machine processes, and with the cost of supervision and of the personnel and wages department, and so forth. In all these cases variations in the amount of overhead cost are governed in the long run pretty closely by the amount of labour employed. In other cases, where the machine as a cost bulks much more largely than that of the labour employed in operating it, it is better to take the machine-hour as the unit, and to allocate the overheads as a charge per machine-hour worked by each machine

or group of similar or linked-up machines. This is standard practice, for instance, in the printing trade.

When we come to the overhead costs of storekeeping, the value of stores issued may give a reasonably close basis of allocation where they are fairly uniform in value and in turnover. Where, however, this is not the case, value may be highly misleading as a basis. Obviously, the storekeeping cost of £10 worth of brass screws held in store for a month, and that of £10 worth of deal board held in store for a year, would be two very different figures. The problem of finding a basis for the allocation of storekeeping overheads which shall neither be excessively inaccurate nor excessively complicated, and, therefore, costly, is a difficult and often an insoluble one for the accountant, and perhaps he had better comfort himself with the reflection that as a rule the overhead costs of storekeeping are relatively small anyhow, in which case the basis is not of the first importance.

We have not yet, however, answered our question. Can accountancy give an exact and explicit answer to the question : What is the cost of a thing, where overheads are involved? And, if not, why not? We may answer at once that the results of cost accountancy are necessarily approximate, and that skill in these operations consists merely in getting as near to the facts as is reasonably possible. This is true, but it is not the whole truth, and really carries us very little farther. The fundamental problem lies deeper, and when just now we used the word "attributable," we were getting very close to it. Accounts, as we saw, began as records of fact, and, although in their modern developments they sometimes represent not so much fact as opinion or judgment—e.g. in the treatment of depreciation—they are still in the main regarded as exhibiting known

and demonstrable fact. When, however, we set out to show what quantity of overhead expense was incurred in the production of any particular unit of output, we shall find, if we think about it, that things do not really happen in quite that way. What actually happens is that the overhead is first incurred, usually at various times, and then at some later date our product is produced. First comes the capacity, then the productive use of it. When, therefore, we say that a product costs £10 in direct charges (labour and materials) and a further £5 in overheads, making a total cost of £15, we are making two statements which do not rest on quite the same basis of fact. It is easy to allocate to a particular job the cost of the material used on that job, and if by that we mean that if the job had not been done we should be better off (ignoring the value of the finished work) by the value of the material used, we are pretty close to the facts. Similarly, when the cost of 48 hours of John Smith's labour is booked to the job we can again say that if the job had not been done we should have been better off by that amount. The cost of the labour is an expense directly attributable to the job. But, when we come to the overheads, the position is different. When we say that the same job cost £5 of overhead expense, we do not mean, because we should not be justified in inferring, that we should have been £5 better off in respect of overhead outlays if the job had not been done. The overhead—the capacity—would in the main have stood idle. And so, when we said a little while back that it would be very difficult to allocate to a particular product the appropriate proportion of the time of the foremen or the clerks in the pay office, it would not have been right to assume that the difficulty was merely a practical or mechanical one. The real difficulty is that the relation

between the time of foremen or clerks and the product is not the same as between the workmen and the product. Later on we shall examine the economic significance of this difference.

If, then, we profess to exhibit in the accounting process of allocation the causal relation between overhead and production, we shall be claiming for our accounting result a significance to which it is not entitled. Cause and effect are economic rather than accounting conceptions. Accountancy aims at recording and demonstrating facts. The most that we can claim is that it shows what proportion of the overhead expense was, in fact, taken up or made use of in the production of any given unit, and even this more restricted objective does not admit of exact ascertainment. This is one reason why we find differences in the methods of allocation, and corresponding differences in "costs."

All the same, there is in the long run a causal relation between direct and overhead costs. It would not be true to say that a particular unit of output *causes* a particular expenditure of overhead, but it is true to say that in the long run a given increase or decrease in the volume of production of those units requires or permits (other things remaining equal) a definite increase or decrease in the overhead expenses which are called into use by that production. For this reason alone, it is necessary to choose the method of allocation which will most exactly disclose that effect, if accountancy is to render the fullest possible service to management.

But there is another reason. Where there is competition, it is a rough general presumption that the amount of overhead which, let us say, Gog & Sons make use of in the production of any particular class or unit of

their output will be the same as that which their competitors, Magog & Co., find it necessary to equip themselves with in order to produce the same article at a competitive price. Accordingly, it is highly important for Gog & Sons, if they have several shops or make several kinds of product, to make sure that their method of allocating their overheads, so far as it enters into their price basis, is one which will allocate them as closely as possible in proportion to their use on the various products. For, if it does not, trouble is likely to follow. They will find—assuming, of course, continuing keen competition—that in those products which are overcharged with overheads in the price they get very little business; while on those which are undercharged they will be incurring a loss. We will leave the story, which accountants tell us is a not uncommon one, at that point.

In the second place, we observe that accounting methods, so far as overheads are concerned, deal essentially in averages. They tell us what the *average* cost of production has been for a given number of units under a given set of conditions in a given period. Even under the most scientific multiple-costing methods, the overhead element of cost in so far as it is brought into the costings has in effect to be averaged.

Averages, however, are not always what they are supposed to be, as was discovered by the man who got drowned through trying to wade across a river, the average depth of which, he was told, was 2 ft. The treatment of overhead costs is far more than a question of method, for underneath it lies an issue of purpose. The accountant's figures are tools for the executive management, and it is as important to know what an average cost means, and the variations which it conceals, as to know what it is. What they do tell us

quite definitely, is, in the first place, the total amount of overhead which has to be recovered in the price of the products collectively, and, in the second place, the variation or "movement" of the overhead costs according to changes in the volume or method or character of production. When, however, we go further into detail and exhibit particular unit products as causing or even as making use of a particular amount of overhead cost, we must bear in mind that we are moving in a somewhat artificial and abstract region, in which it behoves us to understand clearly what we are doing in order that we may not jump to false inferences and wrong decisions. Accountancy shows, for instance, that, with a given productive capacity unit costs rise as output falls. This is clearly true as far as it goes, for the reason that the same (or nearly the same) amount of overhead has to be spread over a smaller number of units produced. But there are very few producers who are in a position to raise their prices when their sales decline; on the contrary, they are usually compelled to lower them, either through competition or with the object of stimulating demand. Thus the accountant is set two problems: it becomes his task to separate the overhead costs of idleness from the overhead costs of actual production, and to exhibit the effect on cost of added or diminished production.

The more that industry becomes concentrated in large-scale productive units, with heavy investments in fixed plant, the more important these questions become. "Business expands," as Mr. Maurice Clark has said, "under pressure of the economies of the full utilization of plant." The management of such concerns cannot rest content with knowing what the average costs of its several products were last month or last quarter, or last half-year. It must, if it has spare

capacity at all, study the question of what additional production or new classes of production would best absorb the spare capacity, what the added cost of those products would be if the capacity were so absorbed, and what would then be the average cost of each class of product under the new conditions.

And so we may observe the still youthful science of cost accountancy trying to break away from the shackles which the traditions of financial accountancy impose upon it. It is even beginning to influence the form of the financial accounts themselves, in order that while preserving the necessary functions of the revenue or trading account, more information may be obtained through the medium of the financial accounts for an economic study of the conditions and possibilities of the undertaking. The intelligent classification of expenditure in the manufacturing or trading account may be of real assistance towards the scientific treatment of overheads in cost investigations. This fact is becoming more generally recognized. The study of overheads as an economic factor in production calls for analysis and comparison. We want to know not merely what the present cost is, but what the cost would be under different conditions which it is within our power, by selling policy or otherwise, to create. The data for such a study must be founded on accounts, but they are only the foundation, not the completed structure. And it is vital that the foundation should be well and truly laid.

The following example will serve to illustrate the sort of analysis that is necessary in any attempt to study the relation of overhead costs to different volumes of output. It only purports to give an idea of the general line of the study, and the reader will, of course, understand that the exact form of analysis which would

be most illuminating depends on the nature and characteristics of the particular business.

#### PRODUCTION COST ANALYSIS

Cost heading	Units and/or percentage of capacity			
	100,000 50%	120,000 60%	140,000 70%	160,000 80%
<i>Overheads—</i>	£	£	£	£
1. Salaries . . .				
2. Wages . . .				
3. Accommodation costs				
4. Depreciation . .				
5. Interest on investment etc., etc.				
<i>Direct expenses—</i>				
6. Foremen . .				
7. Skilled labour . .				
8. Unskilled labour .				
9. Materials . .				
etc. etc.				
<i>Shop indirect expenses—</i>				
10. Light, heat, water .				
11. Power . . .				
12. Repairs, etc. . .				
13. Other labour . .				
14. Other materials .				
15. Excess cost of over- time . . .				
etc., etc.				

Analyses on similar lines will be made for selling and distribution costs and for the general costs of management.

It will be observed that interest on the investment, whether a fixed charge or not, is shown as overhead cost of production. The question whether cost should include interest on capital is much debated. The answer really seems to be that it depends on the object in view. From the purely economic standpoint, interest on the investment is a cost in so far as it is necessary

to provide it in order to attract and retain the required amount of capital. On the other hand, accountants are forced to distinguish between interest due to creditors, which has to be paid regardless of profit, and the return on shareholders' capital, which is a division of profits. In comparing the cost of alternative policies by the differential method, as here, the interest which will be paid (or sacrificed, if additional capital is provided from reserves) on an increase of investment, or will be saved or gained on a diminution of investment, is undoubtedly a cost of or credit to the particular policy.

The above analysis assumes simple conditions of production. If the products are varied, or the conditions otherwise complex, cost analysis is necessarily a more complicated process; but the principles remain the same.

## CHAPTER IV

### THE BEHAVIOUR OF OVERHEAD COSTS

(i) **The Long and the Short Run.** We have seen that overhead cost represents in a general way the cost of providing productive capacity. From the point of view of economic study it is, under modern conditions, the most important element in production cost, because of the difficulty on the one hand and the immense importance on the other of securing the fullest possible utilization of capacity. As the scale of production increases, overhead costs form an increasingly greater proportion of the total cost of production. Modern mass production shows this tendency in its extreme development. The problem of utilizing idle overhead is not, however, peculiar to large-scale production, nor is the solution of that problem to be found in increasing the scale of production.

Overhead costs possess a quality of inflexibility, and the economic study of them consists largely in the attempt to determine the degree and characteristics of that inflexibility for various kinds of overhead cost under various conditions of production and over various periods.

For the material for such studies we rely generally and mainly on accounts. Accountancy has, for practical reasons, tended in the past to devote its interest mainly to the problem of allocating overheads to particular productive units and particular products. In so doing it works in a somewhat abstract and artificial region, and it is important to realize that the conclusions of accountancy as to the total cost of particular products

are apt, so far as the overhead component is concerned, to be not merely approximate but also to some extent artificial or conventional.

Thus, we may detect a certain difference in the two ways of looking at the subject. Economics looks at the behaviour, under various conditions, of the various classes of overhead in relation to the aggregate of production. Accountancy has interested itself specially in parcelling out overheads to various products or units within an accounting period, with the object of recovering them in the price or of providing a means by which management may control its manufacturing and selling costs.

Now, in this process of allocation it is, under competitive conditions, of very great practical importance to do it in such a way as will most closely correspond with the economic facts. But to achieve this we must know what the facts are—that is to say, how the overheads behave. Economic investigation shows that the study of their behaviour in any particular case is the study of the relation to production of a number of “independent variables.” It also shows that it is the *differences* in their variability—in its characteristics, its degree, and its relation to the short run and the long run—that constitute the problem. If all and every cost varied directly and uniformly with output, overheads would present no problem worthy of economic study. But it is the characteristic of those costs which we describe generically as overhead that they do not.

The distinction just mentioned, that between the long run and the short run, is so important in connection with the aspects of overhead cost that we are about to discuss, that a short indication of its significance may be useful at this stage. It must, of course, be understood that the terms are purely relative, and that the

length of the long run and the shortness of the short run must vary according to the circumstances of the industry, of the undertaking, of the process, and of the particular case. The significance of the expression, in connection with overhead costs, is that when any change takes place in the conditions of production, such, for instance, as an increase or decrease in the volume of production or an alteration in productive method, the ultimate effects of the change upon the costs of production may not be the same as the *immediate* effects. Let us illustrate it in a concrete way. In any business which is not 100 per cent efficient (and it may safely be assumed that none is) there is a certain margin of unused productive capacity—of idle overhead. If not everywhere, it will be found, at any rate, somewhere in the undertaking. The management sees that more business can be taken without a *pro rata* addition to the overhead costs, and possibly with no addition at all. It can, therefore, afford to take the business at a lower price, and for a time all is well. The "slack" has been taken up and unit production costs reduced. But, jump ahead for some years, and you will very likely find that the margin of unused capacity has come back; that once more, although production has remained on a higher scale, there is still the same proportion of idle overhead, and that if production cost has not risen to the old level, it is because other economies have compensated for the increase in cost due to the restoration of the "slack." The conclusion may be that the business needs to carry normally or in the long run that amount of "slack" or reserve, although it may be able for a time, or in the short run, to take it up without immediate replacement. Or it may be that production moves in cycles, and that in periods of great activity inefficiencies creep in which

have afterwards under the stimulus of depression to be eliminated by a closer adjustment of capacity to the work available to the undertaking. Whichever way the case is—and both cases are common enough—the significant fact is that there is very frequently a general tendency of overhead costs, expressed as a percentage of prime cost, to remain pretty constant over a long period, in spite of marked fluctuations within the period. This tendency is, of course, liable to be masked by other changes, such as the installation of more and better machinery and by the economies of larger scale production ; but if these disturbing factors are eliminated, we shall frequently find that what happens in the short run is no sure guide to what will happen in the long run. A telegraph company, for instance, having at any given moment spare capacity in its cables, may be tempted to attract new traffic which it can handle during the "off-peak" hours of the day by offering special and lower rates for non-urgent traffic. For a time the policy succeeds ; the idle capacity is earning revenue and the company's profits increase. But, in due course, through the stimulated growth of the cheap-rate traffic, the point is reached at which a new cable becomes necessary. Idle capacity exists once more and a return on the additional capital can only be obtained, failing other economies, by raising the rates. The case of the enterprise which enlarges its capacity with the object of reducing the cost per unit and, having done so, finds that the cost has gone not down but up, is not so rare as one might suppose. Measures of this sort are apt to be taken when the production cycle is at or nearing its peak and prices are high. When the inevitable recession follows, the firm finds itself burdened with a costly extension of capacity which is to a large extent idle, and with costs which for that reason are higher

than those of its competitors. Here we come into contact with one of the main problems of the trade cycle.

We may, therefore, say that one of the characteristics of overhead costs is to adapt themselves more slowly than do direct costs to fluctuations in the volume of production, just because they are in their nature less elastic, and, therefore, that their behaviour in the long run, which is the more important, cannot safely be inferred from their behaviour in the short run.

The distinction has, of course, far wider applications in economics than those which have been mentioned. Economics tends indeed to direct its attention in the main to "long run" or ultimate consequences, and herein lies the cause of the disrespect which is frequently shown by practical men for the judgments of the economist in practical affairs. Economic conclusions would approximate to those of an exact science if the business of the world, which is its subject-matter, were conducted under the conditions of a controlled experiment in a laboratory. But it is not. And when the economist says that the consequences of doing so-and-so will be so-and-so, he implies more often than not that they will *in the long run* be so-and-so if no new and disturbing factor emerges, which was not taken into account among the data of his reasoning. Unfortunately, however, new and disturbing factors have a habit of emerging, and the longer the run the greater the likelihood that something will happen to disturb the economist's calculation. The judgments of economics can only be unconditional in proportion as they deal with abstract or static conditions or, perhaps, with the very short run. The more practical they try to become—as, for instance, in business forecasting—and the longer the run with which they are concerned the more tentative they must be.

(ii) **The Meaning of Cost.** Let us suppose that, wishing to hire a car for a day's run of about 120 miles, we go to a friend in the business and persuade him to let us have one of his cars for the day, with driver, "at cost." He gives us a note to his garage manager to that effect. On our return after the run the manager demands 8d. a mile or £4 for the run. "That seems a bit stiff," we say: "It can't have cost all that. How do you make it out?" "Well," replies the manager, "that's what these cars cost us 'all in'—8d. a mile with driver, before we add on anything for ourselves." "Ah," we say, "but that includes garage and insurance and depreciation and all that sort of thing. What Mr. Smith said was that we could have the car for what it cost him, and he'd have had to meet these overheads just the same if we hadn't taken out the car at all." "Well, then, if that's what he meant, I'd better charge you just the driver's wages and the petrol. Will that suit you?" But, being blessed with an inquiring mind, we say that we still don't think it is quite what our friend Mr. Smith meant, because we gather that the driver is a regular man on a weekly wage, and unless the car would have been hired by someone else if we had not taken it, it cost Mr. Smith nothing to let us have the driver's services for the day. To which the manager, after suitable reflection, will probably reply that he thinks he had better speak to Mr. Smith about it and find out what he did mean.

Now here we have three different kinds of cost. The first was the average cost over a period of rendering this and all similar services as shown by the accounts. Let us call it, for want of a better word, the accounting cost. The second was the prime or direct cost of this particular service, and represented those outlays which can be traced directly to it. These two kinds of cost

are already familiar to us. But the third introduces a new conception—that of differential cost. Differential cost represents the difference in cost between doing a thing and not doing it, or, to put it in another way, the cost of added production or service. Let us examine this distinction between average cost and differential cost a little further.

Clearly, both ideas represent something which is of practical importance in the conduct of business. Unless our car proprietor can make an average of 8d. a mile at least on the hire of his cars, he will be heading direct for Carey Street. On the other hand, the practice of cutting a price in slack times, when the alternative is idleness, is too well established to be regarded as resting merely on the fanciful theories of economists. Railway companies do not run excursion trains and issue cheap tickets out of sheer philanthropy, or even as an advertisement. Still less are electrical supply companies animated by any such motive when they offer to supply energy for power at a third or a quarter of the price they want for the same energy if used for lighting. And all commercial expedients of this type rest on the conception of differential cost.

Now, when we speak of the differential cost of a thing we imply the existence of other, and, so to speak, antecedent costs which are excluded by the differential method. You cannot differentiate from nothing. These may be called residual costs. What we are doing is to analyse the total cost of any given amount of productive effort into those expenses which would not be incurred if production were so much less, and those which would be incurred anyhow. "Differential" and "residual" costs are the two components of the accounting cost of any given amount of production if it is analysed in a particular way. For instance, if the total cost of

production on a programme output of 50,000 cars in a year is £6,000,000 (or £120 a car) and on an output of 45,000 cars £5,580,000 (or £124 a car) the differential cost of the extra 5,000 cars is £420,000 (or £84 a car), and the residual cost *on a production expenditure of* £6,000,000 is £5,580,000. For this latter amount will be spent anyhow, whether it is decided to produce 45,000 or 50,000 cars. "Dumping," we may observe in passing, results from the decision to sell 45,000 on the basis of a cost of £124, and 5,000 in a competitive foreign market on the basis of a cost of £84, in preference to the alternative, which is judged to be impracticable, of trying to sell the whole 50,000 on the basis of £120.

But things are not always as simple as this, and anyone who assumed that the differential cost of added production is *always* less than the average cost of the total production of which it forms a part, might sooner or later, and especially in the long run, find himself in rather serious trouble. Even in the short run, added production may cause a more than proportionate addition to cost by reason of such factors as overtime, the engagement of raw and inferior labour, undue pressure on and neglected maintenance of machinery, and the like. These are regular phenomena of the peak period of a production boom, and it is only rising selling prices or counterbalancing economies which enable them to be carried at all when once the "optimum" volume of production is passed. Again, in the long run, added production reaches the point at which capital expenditure on the provision of increased capacity will be necessary. When that happens, some surplus capacity will again, as a rule, exist, and the differential cost of the extra production which necessitated the addition to capacity will be found to be not less but greater than the average cost of the total production—unless,

of course, as often happens, the new equipment is substantially more economical than the old. Let us take one more example, to illustrate the operation of the factor of incidence (in electrical terminology the "diversity factor") in relation to differential costs—a factor which is of great importance in most forms of public utility service. It will frequently be found (though not so frequently realized) that where there is a pronounced peak load of relatively short duration the differential cost of handling the peak load is greater than the average cost of handling the total load, and greater still than the residual cost, i.e. the cost of handling the traffic without the peak load. It involves the provision of capacity which is only productive for a relatively short time. Consequently, we find utilities, where they can, charging higher rates for peak period than for non-peak period service, with the object both of diverting traffic to the latter period where they can, and of recouping themselves for the cost of the extra capacity where they cannot. This principle underlies all systems of charging for the supply of electrical energy. It is applied to trunk telephone service and to a large extent to telegraph service by means of urgent and deferred rates, and it is being used to an increasing extent by railways and other transportation agencies. The Post Office accepts "printed papers" at the low rate of  $\frac{1}{2}$ d., because it either requires them to be posted during the non-peak period, or reserves the right to handle them only during the less busy hours, when the plant and organization is not working at pressure. Where such rate structures can be applied, and are effective, they are a valuable means of eliminating, or, at any rate, reducing, the economic waste caused by the uneven demands of the public for service.

We see, therefore, that the differential cost per unit

of any part of a total amount of production or service may be less, or greater, than the average cost per unit of the whole. Let us examine briefly the implications of this conclusion. It follows in the first place that where a given amount of production consists of  $x$  units, and the differential cost of each unit is ascertained, the total of such costs, if added together, can be greater or less than the actual cost of producing the  $x$  units. Such a statement may seem to be an excursion into the realm of pure fancy. But it leads to this practical conclusion : that differential costs, so far as they relate to different quantities of the same product, cannot be the basis of any accounting system, for if they were so used the costings would never balance with the financial books. It is essentially a method of cost statistics and analysis, and so used it gives valuable data for executive judgment.

Another application of the idea of differential and residual costs is in relation to what are known as "joint products." The term is used to describe those products of a concern each of which can only, or best, be produced if the others are also produced. A simple example of joint products, applicable to every undertaking in the industry concerned, is that of the various products derived by the refining of crude oil, viz. wax, petroleum jelly, heavy oil, paraffin, and petrol. The proportions of each which are obtained from any given quantity of crude oil may vary according to the process adopted, and according to the nature of the crude oil ; but all are essentially joint products of any refining undertaking. Similarly, the traffic in one direction and the traffic in the reverse direction of a railway system operating between any two points are joint products of the service. The same conditions may be found in one undertaking but not in others of the same general character.

Thus, one dairy-farming company may combine the milk business with the production of cheese and butter and stock farming, while another may use its surplus milk for the manufacture of celluloid substitutes. It is possible to draw a distinction between joint products and by-products, but the difference is merely one of degree, not of kind, and need not detain us, though we may remark in passing that sometimes, with changing market conditions and the progress of applied science, main products and by-products gradually change places, and it is essential to commercial success to realize promptly that this is happening.

Let us now suppose that two products, A and B, can be manufactured at a total average cost of £10 per combined unit, that if A only were produced the corresponding cost would be £6 per unit of A, and that if B only were produced the corresponding cost would be £7 per unit of B. The differential cost of A is then  $\text{£}10 - \text{£}7 = \text{£}3$  per unit, and the differential cost of B is  $\text{£}10 - \text{£}6 = \text{£}4$  per unit. Thus, the sum of the differential costs of one unit of each is £7, as against an accounting cost of £10 for the two units. Clearly, it would not do to add differential costs of various products together. What, then, do they mean? Their practical significance is this: that if (ignoring profit) you can get £6 per unit for A, you can afford to sell B for its differential cost of £4 per unit, and similarly with A, if you can get £7 per unit for B. The realization of this fact revolutionized the methods of charging for electrical energy, and gave a great impetus to electrical development. As a lighting medium, in competition with oil and gas, electricity would stand a rate of charge high enough to cover almost the whole of the residual cost. This being so, it became practicable to supply energy for other than lighting purposes (i.e. for

power and heating) at little more than its differential cost, and as the power load applied to a different period from that of the lighting load the differential cost of power supply would be a much lower figure, and would enable electricity to compete with other forms of power for industrial purposes. At one time electricity supplied for power purposes was described frankly as a by-product.

It does not follow, however, in any particular case that the most profitable results will be obtained by selling one product on the basis of differential cost, and the other on the basis of the full residual cost of the joint production. Indeed, if this were the case, the former would be essentially a by-product, and it would be necessary to assume that the differential cost was equal to the highest price which would secure the sale of that quantity of the by-product which had to be produced in the process of manufacturing the determined quantity of the main product. Such conditions do, of course, exist—as, for instance, with the fertilizer by-products of the American packing houses, or with shipping freights. In the latter case it often happens that, in conditions of competition, where there is a preponderant demand for cargo-space in one direction, freight will be taken in the reverse direction at rates which represent little if anything more than the difference between the cost of making that part of the voyage with the cargo and making it in ballast. That is the economic foundation of the growing use of Welsh anthracite in Canada, for ships which go out to load Canadian wheat for this country can afford to take out Welsh anthracite at a very low rate, the alternative being usually an outward voyage in ballast.

As a rule, however, each product will bear more than its differential cost. The true economic principle in

regard to the price of joint products is that each should be sold on the basis of its own differential cost, plus so much of the residual cost of the two as will procure the sale of the two products in the right proportions —i.e. in those proportions in which the two are most efficiently produced. The working of this principle is exemplified in the railway maxim of “charging what the traffic will bear,” or, as it would be better expressed, “what the traffic can afford.” And under perfectly free conditions and no restrictions, that is how prices will settle themselves. But the free play of the principle is liable to serious interference where there is a producers’ combination, or when (as with railways) the service is carried on under a public control of rates.

What, the reader may ask, is the exact relevance of the idea of costs as differential and residual to a study of overhead costs? What has the one to do with the other? Let us try to answer this question. When a works manager says that his overheads are 75 per cent of his direct labour costs, the statement, taken literally, means that whatever the amount of labour he is employing, within the capacity of his plant, the overheads are still 75 per cent of the cost of that labour; that the proportion is the same whether the plant is working at half capacity or at full capacity. Now this, as we have already seen, may well be true if the figures represent an average taken over a long period. It may be true of the long run. But it is very unlikely to be true of the short run. Added output does not, in the short run, throw up overhead costs proportionately, nor does a fall in output reduce them proportionately. This fact, which every business man knows, shows the importance of knowing how your overheads behave when production varies in volume, and to know this involves the analysis of costs into differential and residual. What

that analysis does is to show to what extent overhead costs will be affected by an increase or decrease in the volume of output, whether of all products or of some. It is, therefore, a corrective of the dangers that are latent in a rigid treatment of overheads, and in the unthinking use of customary percentages.

We must, however, be on our guard against a danger that awaits us in the opposite direction. It would not do to assume that, because added business can be taken at a price based on a lower differential cost, therefore it is sound business to take it at that price. There are other factors to consider—the possibility of maintaining the higher price for the basic quantity of production (this usually involves the problem of different and independent markets for the higher and the lower priced output); the possibility of differential cost rising for further additions to output in consequence of the strain which they put on the productive undertaking, or of additions to capacity, such as additional buildings or plant, which further additions to output might make necessary. A proper use of the differential analysis of costs, backed by foresight and commercial judgment, will ensure that all these things are taken into account.

When we analyse costs into "differential" and "residual," we are necessarily thinking of the cost of definite alternative policies or programmes. We can, however, study the behaviour of overhead costs in a more general way by making use of a rather different classification. We have already from time to time referred to particular kinds of cost as "constant" or "variable"; let us proceed to examine the implications of this pair of terms and of their equivalents, "standing charges" and "running charges." The connection between the two sets of ideas is apparent enough; residual costs can be distinguished from differential costs just because some

costs are less variable, or more constant, than others; but the boundaries are not quite the same.

Now, the classification of the costs of any particular business or other unit as constant and variable, or as standing and running charges, is a useful and informative proceeding in many forms of production, especially in those which involve a heavy investment of fixed capital. This is typical, for instance, of most public utilities, such as transport, communications, and the supply of electrical energy. The use of this classification is helpful, and indeed necessary, in framing a scale of charges which will for a time more or less accurately reflect the demand which each customer makes on the undertaking, and so protect the concern on the one hand against taking business at rates which do not compensate in full for the economic sacrifice which is made in taking that business, and, on the other hand, against losing business which it would be worth while to take.

If, however, we proceed to the economic study of the behaviour of costs—if, as it were, we climb to the top of the hill and observe what is really going on—we shall see that the use of the term “constant” needs a good deal of qualification. It implies a judgment as to the behaviour of costs under varying conditions, and that judgment, we shall find, tends to be valid only within definite and somewhat narrow limits. Of course, if a business remained perfectly stable, and if there were no technical progress or other disturbing factors, its constant costs would really be constant. But its “variable” costs would be constant also, and there would be no point in making the distinction. This is, however, an unusual state of affairs. Industry strives continuously to increase its business and to reduce its costs: to increase demand and, though perhaps a little less vigorously,

to reduce its prices. On the other hand, political and financial disturbances, and the obscure movements of the trade cycle, produce dislocations and depressions which force a lowering of the scale of production. In these conditions the presence of some costs which are less elastic than others is a very vital factor; but there are obvious dangers in assuming that any of them are entirely inelastic. In studying, therefore, the effects which the presence of these inelastic or constant costs produces we must be alive to the limits within which it operates.

To see how definite may be the limits within which a cost may remain constant, we cannot do better than take the case of a telephone exchange. Here there is a heavy investment of plant which at the outset (for exchanges cannot be installed line by line as subscribers come along) must have a capacity far in excess of the initial demand. In this stage, therefore, which may last for many years, the cost of exchange plant is a constant cost, there is considerable idle overhead, and the undertaking could afford to take additional subscribers at a steadily reducing rate. It is, therefore, under strong economic pressure to obtain more subscribers. But as the exchange becomes filled, the position gradually changes and, in due course, if development is going on at all, it becomes necessary to contemplate either a new and larger exchange or an additional exchange, or, where circumstances permit, a substantial extension of the old exchange. Whichever of these courses is adopted, there is involved a relatively large capital outlay, and the existence once more of a large reserve of capacity; the constant cost has ceased to be constant. At this stage the economic pressure is reversed, or at any rate neutralized, and the concern will try to postpone the addition to its fixed charges as long as it can.

In a large undertaking, of course, this series of events is evened out over a great many exchanges; when spare capacity is being created at a few exchanges it is being absorbed at the majority; the proportion of spare capacity tends to remain constant, and rates are averaged and need not have regard to the conditions at any particular exchange. In the small independent telephone companies which are found in America, however, this shifting of constant into variable cost is a common occurrence, and a source of embarrassment to the management and to the Public Service Commissions which regulate their charges.

Constant costs may, again, be observed typically in connection with railway operation. Here we find a heavy capital investment in permanent way, stations and sidings, and signalling equipment, which are to a great extent independent of the volume of traffic. Similarly, though in a less degree, the costs of the provision of rolling stock and of maintenance of permanent way are inelastic, and the same applies to the cost of the minimum staff necessary to keep the system in operation. Lower still in the scale comes the cost of train staff, which varies with the number of trains run, but is constant as regards any one train, irrespective of the volume of goods or number of passengers carried. The supposed facts are sometimes expressed by the formula that the total costs of operation are " $x$  per cent constant and  $y$  per cent variable." This is, however, obviously not only a very rough generalization, but a loose method of expression; for clearly  $x$  per cent could not remain constant while  $y$  per cent varied and still be  $x$  per cent of the larger or smaller total. It would be better put in the form that the total expenses of operation vary at  $y$  per cent of the rate that traffic varies; for instance, if  $y = 60$  per cent, that a 10 per

cent increase of traffic produces a 6 per cent increase in cost.

Even in this form, however, experience shows that the formula is only applicable to certain, and short-run, kinds of fluctuation. It seems to apply, for instance, in America to seasonal fluctuations ; but as regards shorter periods, such as the daily and weekly fluctuations, costs are governed by the peak load, and do not vary to any great extent with the volume of traffic handled at other phases of the cycle ; while as regards the long-run trend, the proportion of costs that remain constant is comparatively small. Railwaymen are, of course, familiar with these facts, although it has sometimes happened, under the stress of competition or in the effort of idle capacity to find employment, that rates have been offered to attract traffic which have been based on assumptions as to the proportion of constant costs not in accordance with the long-run facts.

It is interesting to observe some of the ways in which growth of traffic converts constant costs into variable. First may come the need for additional rolling stock ; then, to minimize the increase, more powerful locomotives and heavier trains are introduced. This calls for strengthening of the permanent way and more siding accommodation. With the denser traffic improved signalling equipment becomes necessary, and eventually duplication of tracks. It is in these ways that, as investigation shows, over a long period the costs classed as constant have tended to increase almost in proportion to the traffic, and the relation of "constant" to "variable" has remained practically stable.

Without going into a further and more detailed study of the behaviour of constant costs under the typical conditions of various industries, we may state briefly

the conclusions to which such studies lead. First, the conception of costs as constant is appropriate to the short run rather than to the long run, in which there are, speaking generally, no constant costs at all. Secondly, though it may be convenient to parcel out the complete costs of any particular concern into two lots, one labelled "constant" and the other "variable," the distinction is essentially one of degree, not of kind. The former become variable at different stages, and a more exact way to put it would be to say that over a sufficiently long period some costs will be found to be relatively constant and some relatively variable, and that the degree of stability varies for almost every kind of cost.

These considerations are important to practical men. As we have seen, the use of customary overhead percentages in deciding whether business shall be accepted or declined at any given price, or, where there is monopoly, in fixing a price, may lead to unprofitable business or the loss of business that would be profitable. On the other hand, it may be equally dangerous to assume that, owing to spare capacity, business which will more than cover its direct cost or running charges will be worth taking at that price. The one formula assumes that no costs are constant even for the time being; the other, that costs which are constant for the time being will remain constant in the altered conditions which the new price may produce. Between these extremes the practical man has to steer his difficult course, and there is no short cut, no substitute for careful judgment based on knowledge of the facts and conditions of the particular undertaking. What may be sound for a manufacturer, to whom an even production load is of vital importance, or in a competitive business in which price fluctuations are typical, may be unsound in a

public utility concern to which the disadvantages of having to raise its charges later may outweigh the temporary gain from their reduction.

(iii) **The Meaning of Capacity.** We have in this discussion spoken of overhead costs as broadly equivalent to the costs of capacity to produce or readiness to serve. Of what exactly does capacity consist? When we analyse it in the particular case of factory production, we find that it includes working capital, fixed plant, and the minimum costs of its maintenance, the accommodation in which operations are carried on, and the minimum charges which it brings with it, such as rates, taxes, and insurance, some stock of materials, tools, and general factory equipment, the necessary managerial and technical staff, and a nucleus of supervising and skilled labour. On the selling side there will, again, be a nucleus of clerical staff and of salesmen, the relative size depending a good deal on the nature of the business, its marketing methods, and the basis on which the selling force is remunerated. It is to be noted that the costs which are the expression of this capacity are partly current outlays, partly a provision against future outlays, partly the necessary return on past outlays. Accountancy comprises in the single term "cost" these three classes of economic sacrifice—past, present, and future, or postponable. To distinguish between these sacrifices in point of time is important both from the wider point of view of industrial statesmanship and from the narrower one of business policy and, in particular, of price policy. To speak of "cost of production" as though it were a fixed and stable and uniform thing, as people often do, is to leave out of account some of the most material factors in modern industry. Anyone, as Henry Ford observes, can say what a cost is: no one can say what a cost might be. But accountancy,

when it is concerned with productive efficiency, rightly ignores the time at which the economic sacrifice takes place, and includes all three classes under the single head of "cost." An efficient concern must not only meet its current outlays, but must earn a return on its investment (thus maintaining its credit), and must provide for the replacement in due course of the assets which it is using up in production. We have here two different points of view: the fact that both are necessary in the successful conduct of business makes it particularly important to understand what the difference between them is.

The capacity which we have been describing consists, it will be observed, partly of fixed physical assets, such as buildings and machinery, partly of convertible or floating assets, such as stocks of material and working capital, partly of labour, and partly of "intellectual overheads"—experience, scientific and technical knowledge, and the like. The capacity of the fixed assets is fairly readily ascertainable and is capable of precise measurement; it is easy to tell what is the maximum duty that can be got satisfactorily out of a machine—its optimum load. To ascertain the capacity of working stocks of materials or working capital is less easy; they are problems of turnover, and turnover is governed by conditions which in practice are often complicated and obscure. Moreover, especially in industries in which the cost of materials forms a large proportion of production cost (the textile industries are typical), the policy is often complicated by the fluctuating market price of materials, so that the problem of buying right overshadows that of getting the maximum efficiency out of the materials held, or, to put it in another way, of working on the minimum stock. Unsound speculative buying of materials is one of the leading

causes of troubles in such industries. However, the problems associated with material turnover are receiving increasing attention, and the policy of hand-to-mouth buying, which has been greatly stimulated by the downward trend of world prices during the last ten years, is evidence that something of this sort is happening. Whether this will ultimately contribute to a more stable demand is difficult to say: and it must not be overlooked that it may result merely in pushing the waste of idle capacity farther back, for materials which are a variable cost to the industry which uses them include in their production cost the constant costs of the industries which produce them. We are here concerned, however, with the minimum stock of materials which the concern must carry, and the cost of carrying this stock is clearly an overhead cost.

When we come to the intellectual overheads, we reach a factor in which the idea of capacity takes on new and interesting meanings. The work of organizers, managers, technicians, and researchers is to be measured not by time, but by quality, and "knowledge," as has been well said, "is the only instrument of production that is not subject to diminishing returns." Thus the capacity of the thinking departments of a concern is governed to a far greater extent than that of the physical assets by the size and scope of its operations and the temper of its management. The problem for the individual concern is whether it makes the fullest possible use of the capacity for which it is paying. The problem for particular industries in general is whether by co-operation or combination in one form or another the waste of intellectual overhead incompletely utilized can be reduced. Here the obstacles lie in the conditions of competition and the secretiveness which it breeds. But there are signs that industrial

leaders are beginning to grapple with the problem. One notable example is the combination of a number of competing concerns in the electric cable-making industry for the purposes of research and exchange of technical information. Another is found in the activities of the Management Research Groups,<sup>1</sup> which are organized for the exchange of managerial knowledge and experience between undertakings which, in the main, do not compete with each other.

Now, idle capacity may come into being in various ways. It may be due to inequalities in the public demand for service, as in public utility services, where many people find no use for electrical energy in the day, and use the suburban transport systems mainly for getting to and from their work in the morning and evening. It may be due to bad organization and planning, so that machines are intermittently idle, or stocks and storage capacity unnecessarily large, because work or stores do not flow evenly through them. It may be due again to a badly balanced organization, in which some parts of the productive equipment can only be in use intermittently, because the amount of work which represents the maximum output of other parts of the equipment provides only a partial load for them. It may be due to the selling organization not being sufficiently closely co-ordinated with the production side. There may be idle intellectual overhead due to unimaginative management or to production on too small a scale. And, lastly, it may be due to a general excess of capacity resulting from the excessively sanguine estimates of promoters and industrialists, or from the general falling off of demand which marks one phase of the trade cycle, or from rapid technical progress

<sup>1</sup> An interesting experiment based on an American model. The address is 23 Bloomsbury Square, W.C.1.

which has made the older plants relatively inefficient, or from the loss through tariffs or other political action of important overseas markets. This list could be extended and analysed in much greater detail.

Some of these causes are within the control of the individual concern; others are not, and are perhaps not wholly controllable at all. But all the evidence goes to show that the systematic search for idle capacity and the study of its elimination almost always produce valuable and sometimes remarkable results. As regards the lines on which the search must proceed, the reader must be referred to the growing literature of industrial management; we can, however, mention very briefly some of the principal methods which are used.

Simultaneously with the analysis of costs, to which reference has already been made, studies of each process will be made, preferably by men who can approach the problems with a fresh and independent mind, in order to discover by observation and statistical analysis where idle capacity or waste of effort exists. Such studies will include the observation and measurement of the effects on the productive machine of any seasonal fluctuations. They will, of course, extend much beyond the overhead classes of expense, but it is with the latter that we are here concerned.

Assuming that, apart from other forms of inefficiency, idle capacity has thus been discovered and measured, the problem then is how can it best be brought into use within the limits which external conditions may impose? If the productive equipment is unbalanced, i.e. if the capacity at one stage of production is greater or less than at others, how can balance best be achieved; if it is balanced but shows idle capacity throughout, or if there are material differences in the load at different

times and seasons, how can a uniform and optimum load be secured?

It may be possible, without touching price policy at all, to improve the position considerably by the use of the scientific management method known as "planning and dispatching." The object of this system is to eliminate waste of labour and machine time by securing an even flow of work through the productive organization. Its introduction has been known to yield quite remarkable economies, even in cases where the conditions have seemed at first sight unfavourable.

If we are producing for the final consumers' market, or if the demand for our products is sufficiently steady, and it is feasible, when necessary, to manufacture up to a point for stock, we shall consider another expedient for securing an even production load, viz. the system of budgetary control. On this plan, a programme of production for a year or other suitable period is settled in advance, on the basis of a carefully worked out sales budget, which itself is based on market analysis. Equipment, materials, technical staff, etc., are organized accordingly. Here, again, the object is to secure a close and uniform adjustment of work to capacity, with all the economies in production cost to which it leads.

Consideration of these devices, however, leads at once to the question of price policy. In order to have a production programme we must have a selling programme, and the determining factor, or a determining factor, in a selling programme is price. We have ascertained, within a reasonably close estimate, and subject to wages and material fluctuations, what production cost will be for outputs of various volume: can those outputs be sold, and if so, at what price and selling cost? Can existing markets absorb a larger output if the price is reduced within the limits indicated by the

cost analysis? Will price discrimination help to enlarge existing markets or to secure new ones? If so, what can be sold in any particular market at a given price? Are improved selling methods or a different selling organization necessary?

Again, in so far as manufacture for stock must, and can, be contemplated as a help towards steady production, can we reduce the risks by standardizing patterns and simplifying the varieties of our products: for, obviously, the fewer the varieties of the same article carried, the less the risk of producing them for, and holding them in, stock. Pattern simplification, where there are numerous independent producers, is a difficult thing to carry through; and its best results can only be attained by co-operation between producers. But the potential economies of simplification, both in the overhead cost of carrying stocks and still more in actual production cost by improved production methods, are often very great, as Mr. Hoover has shown.

Our inquiries may lead us into even wider fields. We may find that the load of our own concern is inevitably unbalanced in relation to its capacity, whatever the volume of production, and that it may be necessary, in order to secure a reasonably full and uniform utilization of capacity, to develop new products, or side lines carrying less than the general margin of profit, or to combine if we can with other concerns whose business will dovetail in with our own.

Now all these methods which we have briefly indicated form part of the reorganization movement known as "rationalization," to which so much attention is at present being directed in all industrial countries. Its object is the fuller utilization of productive capacity and the creation of demand for the increased production. What it must do if it is to become effective, is,

in the place of mere cut-throat competition, to use a more scientific organization of productive capacity as an alternative means of reducing price, and thereby increasing demand. At the back of it all lies the problem of "the full utilization of overhead." On this is really founded much of the technique of scientific management.

And, whatever else we do, we shall make sure that we have a costing system which serves its purpose. It should be a revenue-producer rather than an expense: it must help the management to eliminate the wastes which reduce profits, and, on the other hand, it must not involve the waste of producing more material than the management can digest. The importance of choosing the most suitable method of allocating overheads has already been mentioned. We may, here refer specially to the principle of allocation known as the standard burden method. It is based on a distinction between used and unused capacity, and charges individual products with their share of the overheads which they do necessarily use, but not with a share of idle overhead. The "costs of idleness," or, rather, so much of the overheads as reflect capacity not actually used in production, are brought out as a separate item, to be recovered, so far as they cannot be eliminated, from whatever business can best bear them. The system, while it has its weak points and is not of universal application, is in line with the modern development of costing and statistical technique, which has a dynamic rather than a static point of view.

## CHAPTER V

### OVERHEAD COSTS AND COMMERCIAL POLICIES

IN the preceding chapter we were considering overhead cost from the point of view mainly of the individual business. When we turn to industries as a whole, and to industry in general, overhead cost again emerges as a very powerful force under modern conditions. It lies, as has already been said, at the root of some of the larger current problems of industry; in particular, that of the reconstruction of industry to meet the new circumstances.

Consider first the problems of price discrimination and price cutting, or combination and association in its various forms, which arise through the pressure of "idle overhead." For these policies are ways out of the difficulty created by the presence of constant costs in the fluctuating conditions which are characteristic of industry. Here, however, it is necessary to draw a distinction. There are several kinds of what Mr. Maurice Clark has called business rhythms; on the one hand, the daily, weekly, or seasonal fluctuations which are understood and foreseeable; and, on the other, the longer movement of the trade cycle, the periodicity of which is uncertain, and the duration of any particular phase of it unpredictable. The causes of the former are known, the problems which they create can be exactly measured, and the solution of those problems has to be found within a comparatively simple and narrow range of expedients. Moreover, they are essentially problems for particular businesses and not for industry in general; they belong to business economics rather than to

political economy. And idle overhead, though brought into being by these short range fluctuations, is not itself to any material extent a cause of them. The seasonal fluctuations of agriculture, like those of electricity supply, are due to physical causes, as also, in the main, are the peak loads which harass suburban transportation undertakings. Other peaks and valleys are the result of popular habits based, no doubt, ultimately on convenience. Here we are concerned not with what may be called load-factor problems, but with the larger movement known as the trade cycle; and we are confronted with a much more complex set of conditions. It constitutes a problem not merely for particular industries, but also, and perhaps mainly, for statesmen and for finance and industry as a whole. Because of the uncertain duration of each and every phase of the cycle, it leads not only to idle overhead, but to unemployment and want. It is one of the demerits of the industrial system that while it compels owners of idle plant to seek productive employment for that plant by every means in their power, there is (at any rate until unemployment becomes catastrophic, as it is to-day) no similar pressure on them to find productive use for unemployed human capacity, save as incidental to the employment of the idle plant; so definite is the domination of the machine. Yet the maintenance of idle human capacity can, with truth, be described as a social overhead, the burden of which falls to no small degree upon industry generally. This truth has, of late, come to be realized by industry itself far more definitely than ever before.

In the depression phase of any cycle the first impulse of management is, doubtless, to reduce the variable costs—to save expenses. But with the heavy fixed capitalization of modern industry, and the growing

realization of the burden of social overheads, it has come to be generally felt that reduction of outlay is no final solution. Even on a narrow view the heavier the capital investment relatively to labour cost, the more apparent is the inferiority of the policy of adapting output to the fluctuations of demand as compared with that of evening out, so far as is possible, the fluctuations themselves. But there is much more in it than that.

In considering overhead costs in relation to the trade cycle—what they have to do with it and what light they throw on it—two things must be borne in mind: the first that we are dealing, necessarily briefly, with one aspect only of a complex and obscure phenomenon into which many other factors—political, monetary, psychological, and climatic—enter; the second, that the more light that can be thrown upon it, the greater the possibility of mitigating the hardships which it causes.

The growth of the overhead element in cost seems to aggravate in various ways the fluctuations of the trade cycle, and to give it a self-reinforcing character. The heavier the investment, relatively, in fixed capital, the greater the advantage, so far as production by itself is concerned, of working to a programme based on anticipated demand. But, as the Balfour Committee point out in the report referred to on page vii, "under modern conditions the interval between the beginning of production and the final consumption of the products is often so long that the producers are compelled to found their programme on uncertain forecasts of the market conditions which will prevail when the goods are ready for delivery. In making such forecasts there is a natural human tendency towards exaggerated optimism in times of improving trade, and of corresponding pessimism in times of falling markets. The effects of

this tendency are magnified by the action of stock-holding merchants, who at the first sign of an upward movement take steps to replenish their stocks in anticipation of an increased demand from consumers, and thus increase the pressure on manufacturers, and heighten the optimism of their forecasts." The same tendency applies, *mutatis mutandis*, to the industries which produce capital goods, and in which the fluctuations of the trade cycle are seen in an extreme degree.

It is well known that in those industries which produce capital, or producers', goods, the fluctuations of the trade cycle are, in general, more extreme than in those which produce goods for consumption. Ship-building, a typical industry of this character, has always suffered from extremes of prosperity and extremes of depression. What lies at the bottom of this is the fact that the demand for its products is a demand for productive capacity, and, as such, postponable. And, further, whereas the demand for consumable goods may fall in a time of depression by, say, 10 per cent or 20 per cent, that for the instruments which produce them will cease altogether, apart from replacements of existing capacity. When railway traffic, for instance, falls off in the recessive stage of a trade cycle, the need for additional rolling stock does not fall off proportionately, but stops entirely; and the locomotive and wagon and carriage builders have to live on renewals, and on orders from foreign countries not similarly affected. And this state of affairs tends to continue until the up-swing of trade improvement is well on its way. The far-seeing may be shrewd enough to catch the tide on the turn, but the bulk of the demand is apt to be deferred until the upward movement is well established, and then it comes with a rush, until the

stage is reached at which fresh capital is poured into these industries, newcomers invade them, and all compete to secure delivery of capital goods at the earliest possible moment, with only secondary regard to price. By the time that it is reached producers of capital goods are themselves over-supplied with capacity in relation to the demand which will soon exist for their products.

In the next stage caution sets in. It is likely that the first signs of a check to demand will be in the industries which make capital goods, where unemployment begins to appear, and with it reduced purchasing power in the public. Merchants begin to reduce stocks and hand-to-mouth buying grows. Unemployment increases, and so the downward movement gets well under way.

We need not follow it farther; but we may observe how overhead costs enter into this sequence of events.

In the later stages of the upward movement costs of production are apt to rise. This is due partly to factors not associated with overhead, such as overtime, the employment of untrained and inferior labour, and perhaps some falling off in effort and some deterioration in organization and management; but partly also to the fact that, idle capacity having been earlier absorbed, more capacity has been created, and once more the cost of idle overhead has to be borne. This tendency of industries to over-equip themselves in times of prosperity seems to be one of the factors which add to the severity of the cyclical fluctuations, especially in its effect on the industries which make the equipment. For fixed equipment can be converted to other uses only within very narrow limits.

"There is something about the commercial-industrial system," writes Mr. Maurice Clark, "which bewitches business, so that it does just the thing that it is trying

to avoid, and is held back from doing just the thing it yearns to do—maintain steady operation and avoid idle overhead.”<sup>1</sup> When we examine the characteristics of the trade cycle, we may observe that on the one hand the existence of overhead cost, or, more precisely, of relatively constant cost, produces certain effects on the cyclical movements; and, on the other hand, that the cyclical movements at some stages convert constant costs into variable costs; at others, convert variable into constant; and at all stages, variable costs of one industry, such as materials or power, or the cost of additional equipment, are largely composed of costs which are constant in the industries which produce them. Thus the adjustment of price to fluctuations in demand, theoretically the means by which the balance between demand and supply is maintained, becomes not a simple and rapid process, but a complex, and, therefore, a prolonged and painful one.

For the presence of overhead costs, at a high level, sets up a powerful resistance to price reduction, which is in theory the normal method by which in these conditions demand and supply are restored to equilibrium. Everything suggests that other means should first be tried. Thus resort is had to intensified selling effort—itself an addition to cost—and the search for new markets. Meanwhile prices are maintained, especially where there are trade organizations to support the policy. Nor is it obviously unwise, for not only is production cost at a high level, but all experience shows that when price reductions begin the first effect is to reduce demand still further; for buyers then wait, as far as they can, for the bottom to be reached.

Yet, when we consider the attitude of industry towards other forms of cycle, the behaviour of which is

<sup>1</sup> *The Economics of Overhead Cost*, p. 386

known, such as seasonal and other periodical cycles, we observe that its main effort is to bring its idle capacity into use by price reductions and price discrimination, and by such expedients to develop its off-peak business.

This suggests that if the duration and characteristics of the business cycle could be better foreseen, the attitude and policy of industry to it would be in some degree modified, and that fuller knowledge, if it were attainable, would go far to mitigate the evils of the cycle. For there is a strong incentive to minimize idle capacity, if only people knew how to do it. And the argument becomes even stronger when we consider the effect all along the chain of production of a check to output at the end or, indeed, at any point of the chain.

It would seem, then, that so far as price reduction stimulates demand, there is an incompatibility between the policies of stabilizing output and stabilizing prices.<sup>1</sup> Cut-throat competition does no good in the long run, and all uncertainty is bad for trade and industry. Yet if the extreme movements of the trade cycle are to be mitigated, stabilizing prices seems to be the wrong objective, if only because it naturally tends to operate more on a falling than on a rising demand. We may at any rate infer that if it is possible for industry through price adjustment to make itself more the master and less the servant of demand, it will have to lay stress less on past costs, and more on a full knowledge of differential costs under current and prospective conditions; and it will have just as much need, as under a stabilizing policy, to act collectively, to exchange information, and to admit the public to its confidence.

<sup>1</sup> This refers to the prices of particular products, and must be distinguished from the policy of stabilizing the general price level as expressed in the purchasing power of money.

It may, indeed, be asked, to what extent or in what sense are constant costs costs of production at all? Can it be necessary, at any stage in the chain of production, for any undertaking to refuse business which covers its differential cost—a figure which will usually be lower even than the variable costs induced by it, for even idleness costs something? Are the sacrifices of production, as regards any given unit, more than those sacrifices which a man must make in order to produce that unit? The answer is that, in the long run, unless an industry can recover its costs of production in full, including the normal return upon the capital employed in it, the industry will not go on. Excessive capacity may be eliminated, and business will at times be taken at any price down to differential cost (or even less), but only in the expectation that later on the deficiency will be made up. We are justified, therefore, in reckoning constant costs in this connection as costs which production has to meet; their special characteristic, in relation to the trade cycle, is that they need not be met uniformly at all stages and in all periods. The term covers various kinds of cost, some of which are items of current outlay—e.g. fixed interest charges, rent, and local rates—while others represent a return on past outlays or provision against outlays, such as renewals and replacements, to be incurred at some future date. A manufacturer will not stay in business unless he expects in the long run to cover all his overheads and make what he regards as a reasonable profit, but this does not compel him invariably to decline any business which will not cover what he regards as the overheads attributable to it. This is a fact of some significance. It gives room for some elasticity of price, and makes price reduction, without increase in the volume of output, easier than it would otherwise be.

Price discrimination is, in effect, a particular form of price reduction, designed to find a use for otherwise idle capacity, and so to secure an even and balanced load. It may take various forms, from the mere result of bargaining with different customers in the same market (in the popular sense) at one end to the systematic application of different prices for the same product in home and foreign markets at the other—the so-called "dumping" process. This is becoming more and more the standard practice of all industries with heavy overhead or constant costs, where unit cost depends so largely on output. "The policy of selling at two (or more) prices is likely," says Ashley, "as the scale of operation widens, to commend itself in every business where two (or more) markets are available." (*Business Economics*, page 31.) If resorted to as an alternative to a reduction of price which would produce a greater increase of demand in the markets where a higher price is maintained, its economic effects are bad; but, subject to this reservation, it contributes to stability of output and reduces the wastes of idle overhead.

Just as overhead costs are, as we have seen, a powerful factor in determining production and selling policies, so their influence may be observed in the organization, or reorganization, of the industries themselves. They play an important part in the movement for combination in one or other of its various forms, which has been a conspicuous feature of post-war industrial development.

It is necessary, however, to distinguish between two methods of combination which are radically different, both in constitution and in effect. On the one hand, we have the combinations of producers, for specific purposes, in trade associations of various kinds; on the

other, the amalgamation or merger of a number of undertakings—again in various forms. The essence of the former method is that the individual producers, while agreeing to maintain prices, or to limit output, or to avoid competition, or to mitigate its effects by some form of pooling, still retain their independence; and can leave the association at any time. Associations of this kind, though to some extent brought about by the pressure of overhead, usually make little or no direct contribution to the utilization of idle overhead, so far as their price-regulating and output-regulating activities are concerned. (Their part in research and the provision of trade and technical information is another matter.) Indeed, they tend to keep capacity idle by their not infrequent habit of trying to maintain a level of prices which will keep their less efficient or less favourably situated members alive, and by their failure to do anything to procure the allocation of output among their members in such a way as to secure the most efficient production. "There is often," report the Balfour Committee, "considerable resistance to the enforcement of measures for reducing costs and eliminating waste, which, though to the interest of the combination as a whole, may place some of the constituent undertakings in an unfavourable position in the event of withdrawal from the association or termination of the agreement. For this and other reasons it is generally much more difficult to realize the full economies of unification by means of a terminable association than by a complete merger, and it is probably true to say that terminable agreements have, generally speaking, tended to rely for their success more on the enforcement of restrictive conditions and less on the attainment of positive economies than the consolidation or giant business." (*Factors in Industrial and Commercial Efficiency*, 1927, page 7.)

The other form of combination is that known as the trust, combine, or merger—the combination of a number of separate producing undertakings under a single directive control with complete identity of financial interest. Its forms include the voting trust, the holding company, the exchange of shares with interlocking directorates, and the complete amalgamation into a single corporation. With its forms, however, we are not here concerned, but rather with the connection between overhead cost and the formation and operation of organizations of this type. They are a feature of increasing importance in modern industry, and it seems likely that the movement will, because it must, go very much farther than it has as yet gone.

Consolidations are usually divided into two kinds, vertical and horizontal, according as they are composed of a series of undertakings forming a chain of production at different stages or similar undertakings concerned with the same products. There is, however, a third kind, which is formed by the expansion of a successful business through absorbing concerns which produce not the same products but products which can advantageously be allied with them, e.g. the recent development in the United States by which gas and electricity corporations have acquired ice manufacturing and supply businesses on a large scale. Often they are due to the fact that the parent concern has free capital which it cannot invest in its own business without risk of over-production. These we may, perhaps, call "circumferential" consolidations.

When we pass from the sphere of trade associations to that of consolidations or mergers, we seem to be entering into a new world—a world in which the dominant force is not that which seeks to maintain existing rights and interests, but that which strives to increase

efficiency and output, and to find markets for an increased production. The immediate causes of many, perhaps most, mergers are, it is true, somewhat different. In boom periods it is often the search of the company promoter for profits which brings about a merger, and this is especially true of those which ultimately turn out unsuccessful. Apart from this factor, horizontal combinations are brought about primarily by the desire to avoid cut-throat competition, and vertical and "circumferential" combinations by the desire to save on selling and other classes of expense, to foster by-product business, or to secure the supply of necessary materials. What we are concerned with, however, is not the motives which bring mergers about, but their economic effects when formed; and in these overhead or constant cost plays a leading part. The most significant characteristic of an efficiently conducted merger is that it sets out to reorganize the productive capacity which it has brought together and placed under a single control. On the production side uneconomic units are scrapped, and obsolete equipment brought up to date. Particular units are made to concentrate on particular types of product; unnecessary and unprofitable variations of product are eliminated. Technical research and experiment are concentrated and strengthened. Materials are purchased on a larger scale and on more favourable terms. On the distribution side some kinds of selling cost are reduced, for it is no longer necessary to employ a force to sell A's products to B when A and B become a single concern; and in many ways the selling organization or methods, even if they cost no less, are more effectively used. If the combination is of the vertical type, the higher efficiency created by co-operation between the various stages of production is realized. If it is of the horizontal,

and still more if of the "circumferential," type, it will reap the advantages of what electrical engineers call the "diversity" factor—the fact that the peak demands for different products or from various customers often come at different times, and call for a smaller aggregate capacity if distributed over a single large undertaking than if each demand is directed to a single source of supply. Similarly, the horizontal combination will more easily meet a public demand for variety, reflected in the current practice of hand-to-mouth buying by retailers, without sacrificing the economies of quantity production.

Now the foundation of the various economies above mentioned is the fuller utilization of capacity and the elimination of idle overhead. These overheads consist partly of plant, partly of stocks, partly of "intellectual overhead"—technical, managerial, and commercial knowledge, skill, and experience. It is in the full utilization of those factors that the ultimate advantages of consolidations are to be found; just as it is the public belief that economies and profits are to be gained in this way that makes the merger-forming activities of company promoters, whether well- or ill-conceived, possible. The businesses which most tend towards consolidation, both horizontal and vertical, are those with large fixed capital. Quantity production, ever striving to market its increasing output, finds in combination and intensified selling effort the only alternative policy to the cut-throat competition which its high proportion of overhead cost makes possible; for by this means it hopes, from the economies of combination, to meet the growing cost of distribution, and still leave a margin for price reduction.

That a great increase of productive efficiency is attainable through consolidation, where suitable conditions

exist, seems clear. That it will always be so attained in practice is a much more doubtful proposition. Not only does the process of forming a merger usually lead to over-capitalization, which indirectly tends in various ways to impair efficiency, but the problem of developing a sufficient supply of first-rate directive ability to secure in the giant undertaking the pursuit of a far-seeing and enlightened policy, and the avoidance of inertia, seems far from solved. "The structure of industry," says a rather caustic critic, "is in fact evolving more rapidly than the minds of those who are responsible for its direction."<sup>1</sup>

Our general conclusion may be summed up as follows. In concerns with a large fixed capital, or heavy overhead, such as are characteristic of modern industry, cost of production depends to a preponderating extent upon volume of output. The tendency of industry to equip itself for the peak of demand leads to idle capacity when in the course of the trade cycle demand falls off, or capacity has otherwise outrun demand. Because that capacity represents in the main a fixed capital investment, and not a current outlay, it is possible to sell the products for a time at prices which do not yield a return on the investment or provide for depreciation and obsolescence of the equipment, so long as these costs are covered in the long run. Apart from this, it is always possible to sell the products at different prices in different markets, provided that the overheads are covered in the aggregate. Thus unit cost varies with output, and price can vary as between one market and another, or one time and another, in respect of the overhead factor, all other factors remaining equal. These conditions foster price discrimination at all times and price cutting in times of depression, though as

<sup>1</sup> *Britain's Industrial Future*, p. 131.

regards the latter the uncertainties of the trade cycle, and other reasons, tend to retard price reduction at the time when it would probably be most effective. The fact, or the fear, of cut-throat competition, the tendency of mass production to multiply output, and the intense effort to create additional demand produced by these conditions, coupled with the fact that the investment in capacity is fixed and cannot, like labour or materials, readily be diverted to other uses, combine to set up a strong movement in favour of consolidations or mergers of various kinds; and it seems inevitable that this movement will grow as overhead cost becomes more and more the predominant cost of production.

## CHAPTER VI

### OVERHEAD COSTS AND THE STUDY OF BUSINESS ECONOMICS

WE must now face a question which the student of economics will certainly ask, and which must certainly be answered. Is there any sense, or value, in distinguishing overhead costs from the basic requisites—rent, wages, interest, and profit—of which production cost is composed: in speaking of the “economics of overhead cost” as though economic data, when regarded from this particular angle, would receive any new illumination or yield any new knowledge? Why introduce this cross-classification, and so risk confusing the issues? For clearly such a study can only concern itself with the behaviour of factors already known: it will not lead to the discovery of new factors or set up new principles. We are only dealing with rent, interest, profit, and wages in a particular combination: is there any economic significance in the combination? Does a combination of them behave differently in any way from the theoretical behaviour of the separate component factors?

The answer to this question seems to be twofold. In the first place, business men think mainly in terms of accountancy. Accounts are the tools of management. And unless the conceptions and categories of accountancy are altogether misleading, it is clearly expedient to relate them to the fundamental conceptions of the economics of business; to see where they coincide, and, so far as they do not, wherein precisely the differences consist. Among the leading conceptions or categories

of accountancy we find that of overhead cost. The more that business policy and business decisions come to be based on cost-accounting data, the greater the influence of overhead cost, as determined by accounting processes, becomes. And herein lies the danger; for accounting categories, unless related to the living organism that lies behind them, and its processes, tend to become stereotyped or conventional. We may often observe this in a particular business, when a form of classification, set up in one set of conditions, is persisted in long after those conditions have radically altered, so that the classification no longer serves its original purpose or, indeed, any purpose.

Again, "cost" itself, which in accountancy seems to have only one meaning, or perhaps we should rather say, one use, is found when related to economic processes to be a term of many and varied applications. The economic sacrifices involved in getting from where you are to where you want to be are one thing: the resources of which you make use in your journey from the one point to the other are a different thing. For some of them have already been expended before you start and would remain expended whether you start or not. Moreover, the practical issue is, more often than not, not the sacrifices involved in getting from the point where you are to the point which you contemplate as your destination, but those involved in getting to that destination as compared with those involved in some other journey which is your only or next best alternative. For business rarely stands still; and even when it does some economic sacrifice is going on, even if it is only (in the extreme case) the sacrifice involved in not realizing the break-up value of the concern. The "costs of idleness" are a very real thing. So that it is desirable to enlarge the content of the

term "cost" by a recognition of the various economic conceptions to which it is applicable.

More than this, when once the increasing importance of overhead as an element in production cost is recognized, the need for a new and a freer technique is clearly seen. Cost accountancy as an art is of very modern growth. The Great War, with the inevitably extended use of the "cost-plus" basis of contract, gave an immense stimulus to the practice of costing. Yet it has only begun to find its true lines of development and its appropriate technique. Clearly it must emancipate itself, so far as form is concerned, from the shackles of financial accountancy if it is to escape the dangers of conventionalism and artificiality. It has to solve the problem of freedom to use statistical forms and methods while still retaining its contact and ultimate reconcilability with the financial books. Here, again, overhead cost is the element which creates the problems. Management calls for methods which will tell it as much as possible about the behaviour of its overheads. To do this implies a special technique, some modification of traditional accounting practice, and above all a realization of its fundamental limitations, so that we may be on our guard against drawing unwarranted conclusions from them. And accounting methods which make possible the intelligent study of overheads may provide the means for large economies in the elimination of idle overhead.

We pass to the second consideration. In the study of industry generally and as a whole, we can analyse the resources employed into the basic factors of production—land, labour, capital, organization. When, however, we turn to industry as actually carried on—i.e. from the general to the particular—we find that it is organized in units, each of which has a separate identity

as well as an organic relation to the whole. And further, these units, which consist of part of each of the factors of production bound together in particular, though of course varying, proportions, offer resistance to the free and immediate action of the economic forces which operate upon them. The "flow" of resources into productive uses, of which economists are fond of speaking, is not a steady and uniform stream, but a flow which is broken up into many channels and which is constantly being deflected by obstacles piled up by itself in its uneven and often turbulent progress. It is the various resistances so offered which create the economic problems that most concern business men. Mr. Maurice Clark, in a well-chosen phrase, distinguishes "the laws of economic efficiency in the large" from "the narrow commercial efficiency which breeds the convulsions that sap the strength of business as a whole." The force which holds the productive unit together, and in virtue of which a particular combination of the factors of production acts—so far as it is free to act—in a particular way in any given conditions, is closely related to what accountants call "overhead." This combination forms of each unit a more or less rigid nucleus which tends to act, and to a large extent does act, as a single whole. If there were less capital tied up in fixed assets in the cotton, steel, and ship-building industries of Great Britain, and less technical skill of a specialized type tied up with those industries, some, surely, of the lost mobility of British industry would be regained. It is the frozen rigidity of our productive capacity, organized as it is, that prolongs the post-war depression. Nor can the remedies be found until the fact is recognized.

These considerations apply not merely to the post-war industrial depression in Great Britain; they seem

to be true of modern highly-organized industry in general. Supply and demand for commodities (including services) in the aggregate are two sides of the same thing; supply and demand, as regards particular commodities, tend towards equilibrium through the medium of price. But the adjustment is very far from being immediate or automatic. It takes time—often quite a long time; and the most urgent problems for practical men centre on the length of time thus taken and the means of reducing it. It is the dislocations of industry, created or intensified by this time-lag, whether affecting trade in general or particular commodities only, which call urgently for a better understanding of the underlying forces which produce them. Among these we may discern very clearly the operation of overhead cost, organized, as we have said, in productive units. Between the supply of capacity to produce, and the demand for the products of that capacity, there seems to be no close and easy adjustment. Capacity, it would seem, is almost always in excess of the demand for its products, and it tends to be created not in an even and regular progress, but by fits and starts, in alternations of activity and depression. So that the idea of fixed capacity (fixed not in the physical but in the economic sense) insists obstinately on presenting itself to the attention of anyone who tries to analyse the conditions and movements of modern industrial production. It may be given a wider or a narrower extension as the particular conditions or the method of analysis may require, but it is always there as the central fact of industry.

An economics of overhead cost, then, is essentially, from one point of view, a realist study of the obstacles which organized productive capacity sets up against the free play of economic forces, and of the dislocations

and disturbances which result from the existence of those obstacles. The grave mischief of these disturbances lies in the time which they take to work themselves out, amplified as it is by the self-reinforcing qualities which they seem to have, so that depression and activity are both pushed farther than is necessary for the restoration of equilibrium. How large a part the overhead cost of the unit concern can play in the maintenance of such a resistance is exemplified in the long-drawn-out struggle of the American section of the Lancashire cotton industry to find a new equilibrium. It is pertinent to observe, in passing, that the concentration of industry into larger units and fewer controlling hands should, amongst other advantages, accelerate the taking of the necessary decisions at times when some adjustment of policy becomes desirable, as well, it may be hoped, as making it more likely that the decisions when taken will be the right ones.

From another point of view it is an attempt to illuminate the principles which govern the utilization of capacity in each particular type of industry, by means of the observation and comparison of the data of experience. It provides a basis for a technique which will enable the data to be made use of with the greatest advantage to those who control the industry concerned. In certain industries of the public utility type, especially railways and electricity supply, much valuable work has already been done on these lines, stimulated by the large proportion of overhead cost which their products entail. It is being extended to other industries the more rapidly as overhead cost bulks more and more largely in the cost of production. Here is a ground upon which economists and accountants meet; for the principles elucidated by the one should determine

the form and purpose of the tools provided by the other.

One of the primary objects of that technique is the disclosure and measurement of unused capacity. Wealth can only be increased by increased production, and the return from existing but unused capacity must, unless it is obsolescent or unsuitable, normally be greater than that from new capacity which has to be created. Thus labour has a special interest, which it is coming to realize, in the efficient organization and performance of existing concerns. It seems desirable to emphasize technique in this connection, for it is in the study of particular types of industry, and the characteristics of each type, that useful results are most likely to be obtained.

In some such way we would express, very briefly, what seem to be the significance and scope of an economics of overhead cost. We may pursue this train of thought into some of the current movements and problems of industry organized, as it is becoming more and more organized, on the basis of "high overhead."

Take, first, the problems created by mass production. Industry has, by evolving the principles of mass production, created an instrument of extraordinary potency for increasing wealth. It is founded on high overhead and relatively low labour cost. But, inevitably, it calls for highly organized and intensive selling effort. This leads to a state of affairs in which, as unit production costs decline, unit selling costs in all their various forms rise, so that "high cost of distribution" is already one of the leading problems of industry in the United States, where mass production has attained its greatest development. As selling effort encounters increasing resistance, and as the scope for continued reduction of manufacturing cost, by further improvements in

processes and organization, declines, a conflict arises. Mass production depends on the continuous and steady production of a uniform and standardized product, but is confronted by the consumer's demand for variety and improvement, as a condition of increased sales, and by the wholesaler's tendency to buy from hand to mouth, which is itself partly a reflection of the consumer's attitude. This is what was happening in America before the recent collapse. On what lines will equilibrium be attained? In the first place, these conditions seem calculated to strengthen the tendency towards group organization, of the horizontal type, under the control of a single interest, in preference to the single giant concern making one uniform product. The group of affiliated units is in the best position, while making full use of mass-production methods, to maintain a variety of product and, at the same time, to eliminate some of the increasing wastes of competition: while its financial strength enables it to carry the stocks, the holding of which is through hand-to-mouth buying thrown back more and more on to the manufacturer, and its organization to keep those stocks to a minimum. In the second place, there are some indications that mass production, so far as it depends on standardization of product, has reached the zenith of its development, and that as regards some classes of goods there will be an effort to introduce greater adaptability into the productive equipment itself—to teach the machine to give variety. The idea of making *goods* in the mass as the basis of organization is beginning to pass into that of performing *operations* in the mass. The economic advantages of standardization and mass production are far too great to be sacrificed more than is necessary to keep in phase with demand: the problem is to find that form of organization,

productive and commercial, which will save mass production from overrunning its capacity to sell what it produces.

Another insistent problem of industry to-day, brought into glaring prominence by the collapse which followed the great increase of productive efficiency in the United States, is that of the distribution of its product, and especially of the gains of increased efficiency. In what proportion should the advantage of the higher output accrue to labour in more remuneration, to the undertaking by way of reserves, to the individual shareholder in divided profits, and to the consumer in lower prices? Under conditions of simple price competition this problem would settle itself, possibly in no very long run. But with the great combinations which are becoming increasingly typical of modern industry the conditions of simple competition no longer prevail.

This is one of those problems in which industrialists are becoming compelled to take the wider view and to look beyond the narrow interests of their own concern. It seems to be increasingly realized that the greatest interest of productive industry lies in enlarging the buying power of the public, and that a policy which aims at nothing more than taking business away from competitors, while it may be good for a time for the particular concern, and has, of course, a permanent economic value in so far as it may promote efficiency, is, nevertheless, not enough. Thus, problems of price policy, wage policy, and financial policy become fundamental issues of business economics. These issues are, perhaps, more clearly developed in a self-contained and highly-protected country like the United States than in a country like Great Britain, whose dependence on foreign trade and international services complicates and obscures them. But they are there all the time.

To pursue their analysis would take us outside the scope of this study, but we may, perhaps, advance the proposition that the clue to their solution will be found by paying attention to what we may call the stratification of demand. So far as the gains of increased efficiency are retained in the undertaking, they may be expected ultimately to produce a demand for "capital" or "producers'" goods: if given to shareholders, for both producers' and consumers' goods: if added to wages, for consumers' goods of more general demand, including what may be called "popular luxuries"; while in so far as the benefit is given to the consumer in price reduction, it will increase the consumers' surplus of those classes who already buy the commodity, thus adding to *their* purchasing power in general, and will (if the demand is elastic) attract new consumers, who, however, will only be able to buy the new commodity in place of something else, their purchasing power not being increased by the reduction in price. These must not be regarded as more than broad generalizations, indicating that in so far as an industry is in a position to exercise a choice, important economic consequences depend upon the choice that is made.

Factors and tendencies such as we have noted must operate, it would seem, to bring productive industry more under control. Where heavy fixed capacity and low unit production cost are the characteristic conditions, the day of simple competition between numerous independent producers seems to be over. Though some competition in national markets, and still more in international markets, will remain, it will be a controllable and controlled competition. The place of individual enterprise will be, to a large extent, taken by high administrative ability and industrial statesmanship, the adequate provision of which—if production

is to move on a steady and even keel—is one of the problems of the future.

It is in its bearing on problems such as those just discussed that we find the justification for treating overhead cost as a focusing point in the study of business economics. It leads to the study of the dynamics of modern industry in the age of the machine, of mass production, of the "New Capitalism." For of all the forces which determine the course and movement of industry that of overhead cost seems to-day to be one of the most potent. The central problem of industry is how, with no stable balance between capacity and demand, shall it recover its overheads; both those which involve immediate cash outlay and which must, therefore, be covered in the short run, such as fixed interest charges, local rates, the pay of essential managerial and technical staff, and so forth, and those which involve only the credit of the undertaking and the maintenance of its productive capacity in the future, such as a suitable minimum return on capital, depreciation and obsolescence of plant, etc. The examination of the means which industry does, or can, adopt towards securing that necessary end leads us to the study of many aspects of the economic field. It is an important—perhaps the most important—starting point in the study of the economics of business.

We have glanced at some of the expedients by which industry seeks to cover its overheads and to secure an adequate return on its investment in productive capacity, starting from the basic fact that where overheads enter largely into the cost of production the cost per unit (including overheads) may vary within a very wide range, while, on the other hand, if the immediate situation alone is considered, it is worth while to take business at anything above its differential cost. The

variation in unit cost applies not only to different undertakings at the same time, but also to the same undertaking at different times. "It is a commonplace of economists," say the Balfour Committee, "that under a regime of free competition prices tend to a common level. As regards costs of production, however, there is no such tendency."<sup>1</sup> And the Committee go on to describe how wide the difference in cost due to volume of output may be. In an industry of relatively heavy overhead, an increase of the order of 20 per cent in total cost per unit, as the result of a not exceptional reduction in the volume of output, is evidently a typical condition. The problem is (to quote once more Mr. Maurice Clark) to find means of making prices to cover constant costs while minimizing the waste of unused capacity.

We have noted that the roads pursued by industry in its attempts to escape from these difficulties seem to diverge. One of them lies along the route of price maintenance and restriction of output, the other along that of price discrimination and the elimination of idle capacity by various methods which make for productive efficiency and the lowering of unit cost. In a situation in which there are wide fluctuations of demand, and a relatively fixed productive capacity, the importance of price policy, and the considerable range within which price policies can be chosen under these conditions, become evident. "That business expediency . . . in trade generally involves departure from the policy of seeking to charge every service or commodity with its total cost, there can be no manner of doubt." (Ashley, *Business Economics*, page 37.)

<sup>1</sup> *Further Factors in Industrial and Commercial Efficiency*, 1928, p. 7. This report contains valuable data as to the relation of overhead to direct cost in various industries, and the growth of overhead since 1907.

The greatly increased and increasing attention which is given to marketing and salesmanship, and the disproportionate growth in selling as compared with production cost, are evidences of productive capacity seeking to find employment and to cover its overheads. These factors are clearly producing what is in effect a revolution in the marketing and distribution stages of the progress from producer to ultimate consumer—a revolution in which the independent merchant is gradually being squeezed out. Large-scale productive capacity must control the selling end; it must have the freedom to create demand and the power to regulate it through a complete control of selling price and selling effort. And inevitable as is the disproportionate growth of marketing cost which takes place when heavy fixed productive capacity controls the situation, and necessary as it is for an old industrial country like Great Britain to discard obsolete marketing organizations and methods, especially in competitive markets, nevertheless the development has its dangers unless wisely guided, and unless in marketing, as in production, waste is rigorously eliminated. "One of the hardest things to fasten in the average person's thinking," writes Taussig, perhaps a little pessimistically, "is that the end to which employment should be directed is the increase of the national income—the total flow of consumable goods and services which constitutes the real revenue of the community." (*Principles of Economics*, Vol. 1, page 511.)

Nor does the problem end with the idle machine: indeed, it only begins there. Industry, by the form of its contract, makes labour in the main a variable cost of production. But the cost of maintaining labour in unemployment falls in one way or another on industry itself—in higher wages, to cover the risks of

unemployment, where labour is strong enough to secure them, in rates and taxes in so far as government intervenes with public assistance, and, for the rest, in lessened demand and impaired efficiency. If we imagine the basis of the contract altered, and labour made a constant cost, idle human capacity in times of depression would be recorded as what it really is—in Mr. Clark's telling phrase—"wasted capacity and unabsorbed burden of human overhead." "Business," he observes, "is beginning to think and speak of 'social cost-keeping'—a form of economic reckoning which cuts through the sophisms of private financial accountancy and calls social waste by its true name." Thus the conception of overhead cost extends beyond the ring-fence of the unit concern, and even of the individual industry: it applies to the social organism itself.

## CHAPTER VII

### CONCLUSIONS

To conclude : the study of overhead cost under modern conditions of production compels us to re-examine many of our customary modes of thought. Starting with the ordinary accounting conception of overhead costs as costs that cannot be traced directly to particular units of output, and observing that they play an increasing part in the daily problems and decisions of business, we have inquired what are the economic facts which underlie the conception. It appears that it reflects something more than a mere mechanical difficulty of allocation: it refers to something typical in the organization of modern productive industry—to units which form the more or less stable nuclei in a cosmic system of infinite complexity. Having interpreted overhead cost as the expression of productive capacity thus organized, we are led on to further inquiries. On one side we may analyse it into its various components, incidentally giving to "overhead" cost a modified and somewhat wider range than it receives in customary accounting practice : and thence we may proceed to the study of the behaviour of those components under various conditions, finding, however, that this can only be done usefully for each industry and even for each concern separately. On the other side, we find a field for observation and speculation in the influence which overhead costs exercise on the development and organization, the rhythms and crises, of the business world.

In so doing, we shall find that our study bears in an

interesting way on the application of some of the standard conceptions of economics.

*Cost of production*, as we have seen, becomes under conditions of high overhead an extraordinarily elusive and unstable thing. Within an industry it may vary widely as between one concern and another: within a single concern it may vary just as widely, or more so, as between one time and another, and as between one product and another. Between the expected cost of a thing before production and its actual cost when produced large divergencies are possible. It depends mainly on volume of production.

*Price*, which apart from short-run market conditions is, in theory, determined ultimately by the cost of replacement, or future production, shows a corresponding elasticity. Its range of possible variation is very wide where overhead enters largely into cost of production. Thus the modern conception of "price policy" emerges, reflecting the discretion which producers under these conditions possess, where demand is elastic: and the distinction between the problems which turn on short-run market conditions and those which turn on long-run production costs, becomes not as it were a side issue, but a fundamental factor.

*Competition*. The existence of relatively heavy overhead in production cost makes it possible to sell on the basis of differential cost (i.e. at a level lower even than prime cost): and competition conducted on this basis would soon prove suicidal. Consequently, industry sets up various restraints, based partly on formal agreement between producers, partly on informal understandings and a sort of code of business ethics, by which cut-throat competition on these lines is avoided. Competition is not in these circumstances a constant and uniform force, but varying and uncertain. Business

psychology and custom become important factors in the analysis of an industrial situation.

Our study has of necessity been cursory and tentative. It has aimed at suggesting lines of thought rather than offering solutions. But it will, it is hoped, serve to show that in relating economic principles to the industry of to-day and to-morrow, overhead cost gives a point of view which is of deep significance.



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